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The Relative Effects of Repeated Reading, Wide Reading, and a Typical Instruction Comparison Group on the Comprehension, Fluency, and Word Reading of Adolescents with Reading Disabilities

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The Relative Effects of Repeated Reading, Wide Reading, and a Typical Instruction Comparison Group on the Comprehension, Fluency, and Word Reading of Adolescents with Reading Disabilities

by

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The Relative Effects of Repeated Reading, Wide Reading, and a Typical Instruction Comparison Group on the Comprehension, Fluency, and Word Reading of Adolescents with Reading Disabilities

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This experimental study was conducted to examine the relative effectiveness of a Repeated Reading (RR) and Wide Reading (WR) intervention when compared to typical instruction on secondary struggling readers' comprehension, fluency, and word reading. The sample consisted of a total of 96 students (9th through 12th grade) ranging in age from 13-17 in special education reading and English classrooms. Participants included students with learning disabilities (LD), dyslexia, or students selected as students with significant reading difficulties. The investigator paired students on variables of interest (i.e., reading level) within classes and then randomly assigned pairs to one of three groups: repeated reading (N=33), wide reading (N=34), or typical instruction (N=29). Tutors, trained by the investigator, monitored students as they worked in pairs in each

treatment condition. Intervention was provided daily for approximately 15-20 minutes for 10 weeks.

Treatment effects for each outcome measure were estimated using analysis of covariance (ANCOVA). Results indicate no overall statistically significant differences for any condition. Effects ranged from -.81 to .28 usually hovering around no effect or favoring the C condition over the treatment conditions or favoring the RR condition over the WR condition. Five separate ANCOVAs were conducted using the following dependent variables with each pretest score used as a covariate: (1) Woodcock Johnson Tests of Achievement III (WJIII) Passage Comprehension subtest (RR vs. C = -.10; WR vs. C = -.20; RR vs. WR= .10); (2) Test of Silent Reading Fluency (TOSRE) (RR vs. C = .-31; WR vs. C = -.81; RR vs. WR= .10); (3) Woodcock Johnson Tests of Achievement III (WJIII) Letter-Word Identification subtest (RR vs. C = -.05; WR vs. C = -.11; RR vs. WR = .06); (4) AIMSWeb Oral Reading Fluency System (RR vs. C = -.08; WR vs. C = -.26; RR vs. WR= .18); and (5) Test of Silent Contextual Reading Fluency (RR vs. C = .28; WR vs. C = -.01; RR vs. WR= .28). Results indicate that neither RR nor WR should be implemented for secondary readers with significant reading difficulties and more research into ways to make fluency instruction more explicit and instructional for these students is warranted.

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CHAPTER 1

Introduction

Despite recent reading initiatives such as The No Child Left Behind Act (NCLB, 2002) and Reading First, which emphasize early intervention for reading difficulties, many students reach the upper grades still struggling to read effectively and efficiently. Over the last decade, researchers and policy makers have focused their attention on the need to prevent reading disabilities in young children by intervening early. As a result, however, there has been considerably less attention given to prevention or remediation for struggling readers at the secondary level.

The results of the 1998 National Assessment of Educational Progress (NAEP) showed that 38% of fourth graders and 26% of eighth graders were reading at a "below basic" level. The NAEP also administered a reading assessment in 2002 to approximately 343,000 students in grades four and eight. According to the NAEP data, there was no significant change in progress for students between 1992-2002 and grade eight scores in 2003 actually decreased (United States Department of Education, 2003). The test also showed that almost half of African American and Latino eighth graders read below the basic level. These data suggest that despite recent initiatives to help struggling readers at an early age, the education system is not effectively preparing some adolescents for reading success. To effectively prepare these students, there is a demand for scientifically based reading research (SBRR) to confirm the effectiveness of interventions for increasing student success.

Until reading interventions are strengthened in the elementary grades for all students, secondary schools will still have students who reach the upper grades with reading difficulties. Secondary teachers face the challenge of preventing some students from falling further behind and providing remediation for those who are reading considerably below grade level (Neil & Kelly, 2002). The Alliance for Excellent Education (AEE; 2003) noted that 75% of students with literacy problems in the third grade will still experience difficulties in the ninth grade. Consequently, there are students reaching the upper grades in need of reading remediation.

The Secondary Struggling Reader: Expectations and Accountability

Older students who struggle with reading face great challenges, including not liking to read and reading infrequently (Moats, 2001). When students' reading skills fall or lag behind their peers they read less, which contributes to their reading difficulties (Stanovich, 1986). Many difficulties for readers who are behind start as early as the third or fourth grade. By middle school this gap often widens, and students who should be reading at least 10,000,000 words during the school year may be reading as few as 100,000 words (Lyon, 1997).

As a result of reading less, struggling readers experience further regression in reading as well as in their vocabulary and background knowledge. Because of their limited exposure to print, these students do not have experience with a variety of text structures and vocabulary. Because of their reduced reading practice, their ability to fluently decode print and apply comprehension strategies suffers.

Despite these challenges, secondary students face the demands of more difficult curricula and content (Swanson & Hoskyn, 2001). Over the past decade, students have become responsible for learning more complex content, and teachers are therefore under great pressure to cover more content at a rapid pace (Woodruff, Schumaker, & Deshler, 2002). Our educational system has expectations that all students will be able to decode fluently and comprehend material with challenging content (McCray,Vaughn, & Neal, 2001). Students need to not only be able to decode high level content and vocabulary, but they must be aware of and able to implement strategies to "attack" different types of text to comprehend adequately. Teachers expect students to be able to gain meaning from different content area texts, which range in organizational structures and concepts (NASBE, 2005). Overall, tasks are more complex and there is a large amount of material that teachers must cover.

Another challenge that older readers face is the increasing demand of accountability placed on students and teachers. Currently, consistent with the NCLB Act, all schools must make adequate yearly progress or face a variety of sanctions. Because this includes accountability for all students, including those who struggle with reading, students recognize the pressure of the accountability system (Denti & Guerin, 2004). Teachers are often aware of the lack of literacy proficiency of their students and must be knowledgeable about strategies and interventions that help these students pass the increasingly demanding accountability measures. In order to meet the accountability standards, students must demonstrate proficient reading ability.

Moats (2001) states that "Beyond third grade, poor readers can be taught if the program has all the necessary components, the teacher is well prepared and supported, and the students are given time, sufficiently intensive instruction, and incentives to overcome their reading and language challenges. Given the right approach, students will buy in. In fact, they'll ask why they were allowed to go so far without being taught to read" (p. 39). Moats' statement is promising in regards to the ability of educators to provide remediation so secondary struggling readers learn to decode fluently and comprehend text. Not only do secondary-level struggling readers need more practice to become better readers, but they also need explicit instruction in how to become accurate, fluent decoders who can comprehend complex text. Further research of effective interventions is warranted so that Moats' statement can become a reality for all students.

Effective Reading Components: Confirmed at the Elementary Grades

Based on the past two decades of reading research, the knowledge and practices associated with improved outcomes for teaching beginning readers in the elementary grades have yielded converging evidence that provides confidence to educational leaders and teachers about practices they need to implement. Several reports synthesizing the research and providing guidance for effective instructional practices for elementary students have emerged during the past 10 years (e.g., McCardle & Chhabra, 2004; National Reading Panel, 2000; Snow, Burns, & Griffin, 1998). The National Reading Panel (NRP) report (2000) identified five of the most critical components of reading instruction necessary for students to become proficient readers. These critical components include: (a) phonological awareness, (b) phonics, (c) fluency, (d) vocabulary,

and (e) comprehension. Explicit, systematic, and extensive instruction in these elements of reading are essential for most students with reading difficulties to meet the ultimate goal of reading fluently and comprehending text.

Phonological awareness. Phonological awareness refers to the ability to orally manipulate the individual speech sounds in spoken words. For example, students may be given the task of orally blending the sounds /c/ /a/ /t/ together into the word, cat. Students who struggle with phonological awareness often struggle with reading; however, there is evidence that students who lack phonological awareness skills can be taught phonological awareness (Bhat, Griffin, & Sindelar, 2003; Torgeson, Wagner, & Rashotte, 1997).

Phonics. Phonics and word recognition includes the explicit instruction in letter-sound correspondences and the ability to decode words. Students must be able to decode words accurately and fluently to comprehend text. Students can be taught to decode words through both letter-sound blending (e.g., /m/ /o/ /p/ = *mop*) and rime instruction in which groups of words with similar endings (e.g., *-op* in *mop*, *pop*, *top*) are taught together (Wanzek & Haager, 2003).

Fluency. Fluency is the ability to read text accurately with speed and expression. It is often referred to as the rate of reading in a particular time frame and explicit instruction in reading fluently has been shown to be important for some students (Fuchs, Fuchs, Mathes, & Simmons, 1997). Fluency results when students become automatic in the decoding of print. Students who struggle with fluency read words haltingly and often struggle with particular sight words. Fluency is also important because one's comprehension can become limited by labored reading.

Successful instruction in fluency building includes modeling fluent reading through read-alouds and practicing fluent reading with repeated readings, echo readings, and timed readings (Homan, Klesius, & Hite, 1993; Sindelar, Monda, & O'Shea, 1990).

Vocabulary. Vocabulary instruction includes the explicit instruction in the meaning of words, as well as strategies for students to gain new vocabulary knowledge independently. Students can learn new vocabulary through experiences such as wide, independent reading and explicit instruction in the meaning of new words (McKeown, Beck, Omanson, & Perfetti, 1983).

Comprehension. Comprehension is the ultimate goal of reading and includes the ability for a student to gain literal and inferential meaning from text. Comprehension can be affected by a number of factors. First, when students have difficulty decoding they are not able to read the words in the text. No comprehension strategy will replace the ability for a student to be able to decode accurately (Torgeson, 2004). Second, understanding the meaning of words is essential to the comprehension of text. When students come in contact with words that are too difficult, unfamiliar, or they are unable to decipher the meaning, this will impede comprehension. Comprehension may also break down when students have trouble relating the text to prior knowledge they may have. Being able to appropriately apply comprehension strategies to text and monitor understanding while reading is essential to a student's overall understanding of text (RAND Reading Study Group, 2002). Students must be taught explicit strategies in comprehension to be able to monitor their own understanding of text while reading and be able to adjust when their comprehension breaks down (Edmonds et al., in press). Many teachers may neglect to

teach comprehension strategies to help students gain meaning from text and instead emphasize the content they are trying to teach (Pressley, 2000). Comprehension can also be influenced by the difficulty of the text. If the readability level is too high for a student or the student is unfamiliar with the particular type of text structure such as a compare/contrast expository text vs. narrative text, comprehension can break down (Mastropieri, Scruggs,& Graetz, 2003).

Finally, another factor that might influence comprehension is a student's ability to read text fluently. In fact, scores on brief measures of oral reading fluency are highly predictive of scores on standardized tests of reading comprehension such as the Stanford Achievement Test for students with reading disabilities in middle and junior high school (Fuchs, Fuchs, Hosp & Jenkins, 2001). Therefore, one might assume that once students can read words fairly accurately, there may be value in spending instructional time practicing fluent reading. Chard, Vaughn, and Tyler (2002) noted that fluency growth for younger students was associated with comprehension growth even when the intervention was not directly aimed at improving comprehension. Therefore, an added benefit of an intervention targeting fluency is that it may also positively effect comprehension.

Significance of the Problem

A growing number of students in the secondary grades are demonstrating deficiencies in the literacy skills they need to be successful in academic situations and to be productive citizens in society. At the same time, there is an increasing amount of knowledge regarding best practices for interventions at the elementary level to increase students' gains in reading proficiency. At the elementary level, for example, it has been

confirmed that reading rate and comprehension are related (Shinn & Good, 1992). We often assume that practices that have been shown to be effective with young children will be equally effective with older students; however, the nature of reading may in fact shift to reflect a need for students to be able to analyze literature and make meaning from more complex expository text (Fuchs et al., 2001). Verbal processing and text reasoning may actually become more important as students get into the upper grades and are faced with more complex text (Schatschneider, et al., 2004). Therefore, the relationship between aspects of reading such as oral reading fluency and comprehension may be different in the younger grades than in the upper grades (Jenkins & Jewell, 1993).

However, some findings suggest that reading fluency is a significant variable in secondary students' reading and overall academic success (Rasinski, et al., 2005). Reading words correctly and at an appropriate speed has been associated with comprehension and learning from text (Kuhn & Stahl, 2000; Shinn & Good, 1992). Fluency may also be essential to practice for older students because this is a component of reading that students with significant reading difficulties consistently struggle with (Lyon, & Moats, 1997; Meyer, & Felton, 1999; Torgesen, Alexander, et al., 2001; Torgesen, et al., 1997) and fluency is often neglected in reading instruction (Allington, 1983).

Overall, while our knowledge regarding the role of fluency in the reading success of older students is less understood than for younger readers in the absence of research, we can form hypotheses based on interventions conducted with younger students that there is reason to believe that struggling readers, particularly those struggling with

reading fluency, can benefit from interventions aimed at improving their reading rate and accuracy. Knowing what fluency interventions or elements of intervention are associated with effective outcomes for secondary struggling readers is essential (Pressley, 2000).

Statement of Purpose

The purpose of this study was to compare the relative effectiveness of a repeated reading (RR) intervention, a non-repetitive wide reading (WR) intervention, and a typical instruction comparison (C) condition by examining fluency, comprehension, and word reading outcomes for secondary struggling readers.

CHAPTER 2

Review of Literature

The Role of Fluency in the Process of Learning to Read

Two of the first researchers to bring fluency to the forefront as a critical element in the reading process, LaBerge and Samuels (1974), introduced the theory of automatic information processing. They proposed that to be an efficient reader, a student should be able to recognize and identify words instantly and then connect the words as they read to make meaning. Perfetti (1985) extended this theory when he explained that focusing on decoding consumes memory capacity, which inhibits comprehension. In addition, Carver (1997) introduced the rauding theory, which proposes that a student reads at the fastest rate at which he or she can comprehend text. All of these theories suggest that fluency is an outcome of a set of learned skills and that there is a connection between being a fluent reader and being able to comprehend text (Fletcher, Lyon, Fuchs, & Barnes, 2007).

Chall (1983) describes six stages of learning to read which correspond to these theories, and through these stages the role of fluency can be understood. The first stage, pre-reading literacy learning, includes the development of concepts of print and phoneme awareness. The second stage includes the beginning of formal reading instruction and the development of a learner's sound symbol correspondence. It is the third stage of the reading process, however, often referred to as the "ungluing from print" stage, in which students develop fluency. Students in this stage have already established basic decoding ability and are developing automaticity in processing print as well as making use of the prosodic features in text such as appropriate stress and intonation in their reading. Chall

suggests that after mastering the "ungluing from print" stage, it should be easier for students to read for meaning. Therefore, in the next stage, students make a shift from learning to read to reading to learn. In this stage, students learn to interact with expository text and complex vocabulary. Finally, students enter the final stage of reading in which they are able to consider multiple viewpoints and critically evaluate what they read.

More recently, researchers such as Wolf and Katzir-Cohen (2001) have shifted their work to address fluency as a skill that must be honed when acquiring literacy instead of as an outcome of a series of skills. They raised the idea that some students with reading disabilities have specific problems in naming speed, which differs from students who face challenges related to phonological processing. Wolf and Bowers' (2000) double deficit model of reading disability, which corresponds with this idea, suggests that interventions for students who can decode accurately but remain dysfluent should focus on improving fluency. Students who fall in the double deficit subtype demonstrate the co-occurrence of phonological and naming-speed deficits.

Fluency: Essential but Difficult to Impact

Students who read text slowly tend to focus their efforts at the word recognition level, making it difficult for them to attend to meaning (Samuels, 1979). Students who can read text fluently are generally overall better readers, as they are able to demonstrate an understanding of the text they read (Shinn & Good, 1992). However, fluency has been a very difficult area to impact through intervention. In intervention studies that have effectively focused on and increased other critical reading components such as phonological awareness, word reading, and reading comprehension, fluency outcomes

were not significantly affected (Lovett, Steinbach, & Frijters, 2000; Torgeson, 2004; Torgesen, Alexander, et al., 2001). Therefore, making progress in related skills of reading such as word recognition ability has not consistently influenced fluency.

Lyon and Moats (1997) noted "improvements in decoding and word-reading accuracy have been far easier to obtain than improvements in reading fluency and automaticity" (p.579). Therefore, while targeting fluency directly remains a necessary component of a reading intervention, questions remain regarding the extent to which the development of related reading skills will impact fluency.

Previous reports of effective fluency interventions (Chard et al., 2002; Kuhn & Stahl, 2000; Meyer & Felton, 1999; NRP, 2000; Therrien, 2004; Wolf & Katzir-Cohen, 2001) have identified and synthesized fluency studies for struggling readers primarily at the elementary level. A previously conducted synthesis of effective fluency interventions for students at the secondary level (Wexler, Vaughn, Edmonds, & Reutebuch-Klein, in press) and fluency practices that have been examined through research at the elementary level can be organized into the following categories: repeated reading with and without a model, criteria for repetitions in a repeated reading intervention, text difficulty, and intensity of intervention. For a table illustrating the design and major findings of secondary intervention fluency research see Appendix A.

Elementary vs. Secondary Fluency Research

Repeated Reading With and Without a Model at the Elementary Level

Overall, previous reports on fluency outcomes (Chard et al., 2002; Kuhn & Stahl, 2000; Meyer & Felton, 1999; NRP, 2000; Therrien, 2004; Wolf & Katzir-Cohen, 2001)

revealed that repeated reading practice does improve speed as well as accuracy in reading for younger and older elementary students (Meyer & Felton, 1999). Repeated reading without a model involves having students independently read a passage within a specified amount of time without having the passage modeled prior to reading by, for example, an adult or tape recording. Chard et al. (2002) reported that using repeated reading without a model still produced overall better scores on fluency, accuracy, and comprehension than reading a passage only one time.

Interestingly, when Kuhn and Stahl (2000) examined studies with multiple comparisons, they found that eight studies showed the repeated readings group was significantly different than the control; however, 21 comparisons did not show this effect. It is important to note that the majority of studies were with at risk students. However, nine of the studies were with average and above average students. It is also important to note that sometimes the comparison intervention was a non-repetitive reading treatment in which the students read the same amount of text as the students doing repeated reading. Therefore, the question remains regarding the overall treatment effectiveness when comparing repeated reading to the same amount of non-repetitive reading.

Repeated reading with a previewing procedure requires a student to listen to some type of model of good reading of a passage prior to reading it independently. Using repeated reading with a model (i.e. a tape recording or computer) seems to be more effective than not using a model at all; however, modeling from a teacher or another adult is the most effective method of repeated reading with a model (Chard et al., 2002; Therrien, 2004). Another effective practice is to conduct repeated readings by pairing a

peer or cross age tutor with a struggling reader to provide the student with a model for good reading and a chance to receive corrective feedback (Kuhn & Stahl, 2000).

Repeated Reading with a Model at the Secondary Level

In a recent synthesis of fluency interventions for secondary struggling readers, Wexler et al. (in press) found twelve studies that examined the effects of repeated reading with some type of model or previewing procedure (Conte & Humphreys, 1989; Daly & Martens, 1994; Freeland, Skinner, Jackson, McDaniel & Smith, 2000; Fuchs, Fuchs, & Kazdan, 1999; Mercer, Cambell, Miller, Mercer, & Lane, 2000; Rose & Beattie, 1986; Rose & Sherry, 1984; Scott & Shearer-Lingo, 2002; Shapiro & McCurdy, 1989; Skinner, Cooper & Cole, 1997; Skinner & Shapiro, 1989; Strong, Wehby, Falk, & Lane, 2000). Findings are summarized by type of model, e.g. audiotape.

Modeling by an audiotape. Five studies utilized an audiotape as a model of good reading for students before they began reading isolated words or passages (Conte & Humphreys, 1989; Daly & Martens, 1994; Rose & Beattie, 1986; Shapiro & McCurdy, 1989; Skinner & Shapiro, 1989). Results were mixed with slight improvements in reading rate, but not necessarily in other reading tasks such as word recognition and comprehension. One study showed that students who previewed words or passages by listening to a tape of good reading prior to reading again improved their reading rate on passages or word lists (Daly & Martens, 1994). Other positive results were reported by Rose and Beattie (1986) who found that by using a pre-recorded audiotape of a teacher reading as a model of good reading, students were able to improve their reading rate. This study also included a condition in which the teacher provided a model of good reading

and results showed there were no differences between conditions. Interestingly, although some of the students who used an audiotaped model of good reading improved their reading rate on future readings, these same students did not necessarily improve their word attack or comprehension ability (Conte & Humphreys, 1989). Students showed minimal generalization ability from listening to an audiotaped word list when compared to reading the word lists in passages (Shapiro & McCurdy, 1989; Skinner & Shapiro, 1989). This suggests that the effects of having an audiotaped model of good reading may improve reading rate on practiced passages or word lists, but this improvement may not generalize to unpracticed passages or to a broader range of reading tasks such as word recognition or comprehension.

Modeling by an adult or more proficient peer. Seven studies utilized an adult or peer as a model of good reading before or during reading while students engaged in repeated reading of isolated phonics elements, words, and/or passages (Freeland et al., 2000; Fuchs et al., 1999; Mercer et al., 2000; Rose & Sherry, 1984; Scott & Shearer-Lingo, 2002; Skinner et al., 1997; Strong et al., 2000). The adult model of good reading used in these studies was either the experimenter, the students' teacher, or some other instructor. To provide a model of good reading, studies conducted by Freeland et al. (2000), Mercer et al. (2000), Scott and Shearer-Lingo (2002) and Strong et al. (2000) used an adult reader to provide corrective feedback by having the adult provide a correction when students made a mistake during or prior to reading. The study by Fuchs et al. (1999) used a peer to provide corrective feedback if a student was stuck on a word during reading. Overall, the studies showed inconsistent improvement in reading rate and

comprehension. For example, students in the Strong et al. (2000) study improved their reading rate on both independent and instructional level text although there were minimal improvements shown in comprehension questions answered. The study by Fuchs et al., (1999) resulted in small gains in comprehension (ES=.25), but in contrast to the elementary Peer-Assisted Learning Strategies (PALS) procedure (Fuchs et al., 1997) no gains in reading rate were found. The comprehension gains may be attributable to the other components of the PALS procedure, including a prediction and summarization component, both of which are comprehension strategies. Additionally, the lack of gains in reading rate may be due to the relatively small emphasis on repeating reading in this intervention, which consisted of only 10 minutes of sustained reading total for each pair during each session.

Studies by Skinner et al. (1997), Rose and Beattie (1986) and Rose and Sherry (1984) all showed fairly consistent improvements in reading rates when using an adult as a model of good reading. Studies by Skinner et al. (1997) and Rose and Sherry (1984) both found better outcomes for using an adult model of good reading compared to silent previewing. Furthermore, Skinner et al. (1997) found better results when the adult model of good reading read at a slow rate of approximately 50 words per minute while the student follows along.

Overall, having students preview text with some type of model of good reading or having an adult provide a model of good reading through corrective feedback seems to have positive effects on reading rate, although these improvements may not necessarily generalize to word reading accuracy or comprehension.

Repeated Reading without a Model at the Secondary Level

Six studies in the Wexler et al. (in press) synthesis examined the effects of repeated reading without a model or previewing procedure (Carver & Hoffman, 1981; Homan et al., 1993; O'Shea, Sindelar & O'Shea, 1987; Rashotte & Torgeson, 1985; Steventon & Frederick, 2003; Valleley & Shriver, 2003). These studies addressed the question of whether repeatedly reading text would increase reading rate and/or have an influence on comprehension. Each student repeatedly read text independently a minimum of one time and a maximum of ten times and/or until a certain criterion was met such as three consecutive fluency improvements.

Similar to the results noted above, studies of for repeated reading using a model, several studies of repeated reading without a model also resulted in slight increases in reading rate (Steventon & Frederick, 2003; Valleley & Shriver, 2003) or overall reading ability according to a Rate of Good Reading (RGR) score (Carver & Hoffman, 1981). In the study by Steventon and Frederick (2003) students participated in a repeated reading condition added to the Corrective Reading Decoding Strategies B2 program (Engelmann, et al., 1998). The one subject in this study who metthe synthesis criteria showed slight improvement in reading rate in practiced passages, but improvements did not generalize, as no improvements were demonstrated in unpracticed passages. In the study by Valleley and Shriver (2003), students read a passage until they demonstrated three consecutive fluency improvements. Results were mixed with inconsistent improvements in oral reading fluency over baseline.

O'Shea et al. (1987) studied the effects of having students read text one, three, and seven times with a cue to read for fluency or comprehension. Results showed the cue had little effect on reading rate, but rather the number of times a text was read repeatedly had the most influence. Specifically, reading text seven times had the most impact on reading rate. It is also important to note that there were bigger differences favoring three rereads over one reread than seven rereads compared to three rereads, indicating that perhaps three rereads would be sufficient for building fluency, saving more time for instruction. Comprehension seemed to be most effected by the number of rereads, with seven having the largest effect. When comparing the effects of using a fluency or comprehension cue on comprehension outcomes, prompting a student to read for comprehension had the most effect.

Elements that Influence Fluency Performance in Repeated Reading Interventions

Criteria for Repetitions in a Repeated Reading Intervention at the Elementary Level

Repeated reading interventions vary in the number of times a student rereads the passage to attempt to positively effect reading rates. These rereading requirements generally range from one to seven times. Meyer and Felton (1999) suggest that the general consensus regarding the amount of re-readings necessary to effect fluency and comprehension is three to four times. Therrien's (2004) results also showed that to positively effect comprehension, four rereads was better than three rereads.

Instead of setting a rereading requirement, some fluency interventions require students to reach a certain criterion such as a specific oral reading rate. Therrien (2004) reported that studies that required students to reach a set criterion had better results than

the studies that specified a number of re-readings. Kuhn and Stahl's (2000) synthesis did not find a clear positive effect for either procedure.

Criteria for Repetitions in a Repeated Reading Intervention at the Secondary Level

Some researchers have investigated the number of times students should read text repeatedly at the secondary level. O'Shea et al. (1987) studied the effects of having secondary students read text one, three, and seven times and the effect on fluency and comprehension. Students read more fluently on the seventh reading than on the third reading and more fluently on the third reading than the first reading.

As described for elementary readers, another way to conduct a repeated reading intervention is to specify criteria that students must reach before they are allowed to proceed to the next passage or move up in text difficulty. For example, a researcher might require a secondary-level student to reach 100 words correct per minute on a passage before moving to the next level. While none of the studies identified by the Wexler et al. (in press) synthesis compared setting different criteria in one single study, we can learn from the results of the studies that set various criteria. Valleley and Shriver (2003) had students engage in repeated readings in which the students reread the same passage until they demonstrated three consecutive fluency improvements or ten consecutive readings. Thus, the students read a passage a minimum of four times. Fluency improvements were defined as one more word per minute correct. Although results were fairly inconsistent, students made some gains in oral reading fluency with just ten hours of repeated reading. In another study, Conte and Humphreys (1989) studied the effects of repeated reading with audiotaped material compared to students who received an alternative reading

program. Their criteria specified that students had to read a passage without assistance of an audiotape and without hesitation (no pauses of five seconds or less), at the same speed as the tape, and no oral reading errors that distorted the meaning of the text. Students participating in the repeated reading condition showed significant effects of treatment on oral reading speed scores (ES=.97) and silent reading speed scores (ES=1.02).

Text Difficulty at the Elementary Level

There is some variation among findings regarding the difficulty of text to use in interventions to positively affect fluency. Some researchers report that using independent level text or text that can be read accurately as the basis for fluency work with struggling readers will have the most positive outcomes (Chard et al., 2002; Meyer & Felton, 1999). Kuhn and Stahl (2000), however, evaluated 11 studies that used materials at or above the child's instructional level and found differences favoring the treatment group which used higher level text. A majority of the subjects in these studies were students reading below grade level. They hypothesize that using more difficult materials in fluency instruction will lead to the greatest gains.

To better understand the influence of text difficulty in repeated reading interventions, results from two studies can guide us. High school students in a study conducted by Valleley and Shriver (2003) repeatedly read passages at the fourth and fifth grade level despite the fact that they did not meet their instructional level on baseline at either of these grade levels. Students also read cloze passages at the ninth grade level. Interestingly, after an additional ten hours of repeated reading practice, students improved their oral reading at the fifth grade level more than the fourth grade level when

compared to respective baselines. Also, students made gains in words correct per minute on ninth grade cloze passages. Therefore, repeated reading seemed to increase secondary students' oral reading fluency on passages above the students' instructional level and repeatedly reading text with shared words increased fluency from one passage to the next. The repeated reading did not have an effect on students' comprehension.

In a related study, Rashotte and Torgeson (1985) also demonstrated that students increased their fluency in text by repeatedly reading text that shared a high degree of word overlap compared to repeatedly reading text that did not share common words. However, using text with a high degree of shared words in a repeated reading intervention did not improve students' comprehension or word recognition ability.

Intensity of Intervention at the Elementary Level

The intensity of most fluency interventions investigated at the elementary level was limited. Most interventions are intended to be quick and fairly non-disruptive to the classroom procedures already in place. Studies of fluency typically range from 1 to 15 days (Wolf & Katzir-Cohen, 2001). In addition, the duration of each session ranges only from about 10-20 minutes (Meyer & Felton, 1999). While a quick, non-intrusive intervention may seem ideal, in order to produce more positive effects, studies longer in duration may be necessary.

Most fluency interventions at the secondary level were also relatively short in duration. One of the longest studies reported 40 sessions (Fuchs et al., 1999). In addition, fluency interventions in studies were typically implemented only a few times a week and were an average of 5-20 minutes long. Some of the highest effects noted on studies in the

synthesis by Wexler et al. (in press) came from studies with at least 20 sessions with an average length of about 15 minutes.

Methods to Improve Fluency: Repeated Reading vs. Wide Reading.

As illustrated above, repeated reading is one method to increase fluency that has been found to be effective in some studies (e.g. O'Shea et al., 1987). Repeatedly practicing reading the same text may improve a student's ability to decode rapidly and accurately and ultimately, frees their attention to focus less on decoding and more on comprehension.

For a repeated reading intervention, studies show that incorporating the use of an audiotape or model of good reading for students to preview a passage before reading it again improves reading rate (Daly & Martens, 1994; Rose & Beattie, 1996). Interestingly, although some of the students who use an audiotaped model of good reading have shown improvement on reading rate, these same students do not necessarily improve their word attack or comprehension ability (Conte & Humphreys, 1989). In addition, some students are not able to generalize their success to unpracticed passages (Shapiro & McCurdy, 1989; Skinner & Shapiro, 1989). This suggests that the effects of using an audiotape to provide a model of good reading may improve reading rate on practiced passages or word lists, but this improvement may not generalize to unpracticed passages or to a broader range of reading tasks such as word recognition or comprehension.

While repeated reading practice may have promise to build reading rate, at the secondary level students are faced with reading and comprehending much more complex text. Using repeated reading on practiced passages as a primary method to increase

students' fluency level may not be sufficient to increase rate on unpracticed passages and may sacrifice student exposure to a variety of text structure, vocabulary and content (Homan et al., 1993).

There is also some evidence that fluency can be positively impacted by reading widely. Reading widely differs from repeated reading in that the goal is to read a wide range of related or connected text rather than reading the same text over and over. Rashotte and Torgeson (1985) found that repeated reading of unrelated non-overlapping stories and stories with a high degree of word overlap four times slightly improved reading rate compared to a condition of the same amount of non-repetitive reading. When passages did not have a high degree of shared words, there were no differences in reading rate gains compared to reading an equivalent amount of non-repetitive text. While reading rate improved, word reading accuracy and comprehension did not improve as a result of the repeated reading condition.

In a study by Homan et al. (1993), sixth grade Chapter I students were assigned to a repeated reading condition in which students reread text four times with peer and teacher supervision, (but with no feedback) or to a non-repetitive condition in which students participated in echo reading, cloze reading and unison reading. Moderate effect sizes favored the assisted non repetitive condition over the repeated reading condition for both rate (d= -.51) and comprehension (d= -.36). Therefore, increasing the amount of connected text that students read and, therefore, increasing their exposure to print may be as beneficial as a repeated reading intervention while also exposing students to a variety of content, different text structures, vocabulary, and different genres (Homan et al.,

1993). Kuhn and Stahl (2003) noted that spending time orally reading connected text instead of repeatedly reading text may have positive effects on fluency and comprehension. Results from intervention studies with older, struggling readers show that there may be no differential effects (or effects may favor the same amount of non-repetitive reading) for repeated reading and the same amount of non-repetitive reading for increasing speed, word recognition, and comprehension. It becomes increasingly more important for students in the secondary grades to make sure instructional time is well spent and generalizable as secondary students are faced with getting through a variety of greater amounts of complex text.

CHAPTER 3

Methodology

Overview

The purpose of this study was to compare the relative effects of repeated reading, wide reading, and typical instruction on comprehension, fluency, and word reading outcomes for students identified as having learning disabilities in reading or dyslexia, and students with significant reading difficulties. The investigator paired students according to variables of interest (i.e. reading level) within classes and then randomly assigned pairs to one of three groups: repeated reading (RR), wide reading (WR), or typical instruction (C). Tutors, who were trained by the investigator, monitored students as the students worked in pairs in each treatment condition.

Research Questions

The following research questions guided the study:

1. What is the relative effect of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on reading comprehension?
    A. How effective is repeated reading compared to a typical instruction comparison group on students' outcomes on reading comprehension?
    B. How effective is wide reading compared to a typical instruction comparison group on students' outcomes on reading comprehension?
    C. How effective is repeated reading compared to wide reading on students' outcomes on reading comprehension?

2. What is the relative effect of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on reading fluency?
    A. How effective is repeated reading compared to a typical instruction comparison group on students' outcomes on reading fluency?
    B. How effective is wide reading compared to a typical instruction comparison group on students' outcomes on reading fluency?
    C. How effective is repeated reading compared to wide reading on students' outcomes on reading fluency?
3. What is the relative effectiveness of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on word reading?
    A. How effective is repeated reading compared to a typical instruction comparison group on students' outcomes on word reading?
    B. How effective is wide reading compared to a typical instruction comparison group on students' outcomes on word reading?
    C. How effective is repeated reading compared to wide reading on students' outcomes on word reading?

Description of Sample

Selection Criteria

The sample consisted of a total of 106 9^{th}-12^{th} grade students ranging in age from 13-17. Students were eligible for the study if they were enrolled in special education reading and English classes. Due to attrition, at the end of the study there were 96

students with pre and post test data. Therefore, the attrition rate was approximately 9%; however, there was no differential attrition across conditions.

Participants included students with learning disabilities (LD) or dyslexia and students selected as students with significant reading difficulties. The sample also included a small number of students with emotional disabilities (ED), other health impairments (OHI), mental retardation (MR), autism (AU), and auditory impairment (AI). All of the students were enrolled in special education English or reading classes, and a majority of the students met the criteria of scoring below the pass rate (below 70%) on the reading section of the Texas Assessment of Knowledge and Skills (TAKS). Permission to participate was obtained from parents and from students themselves.

Grade, ESL Status and Gender

A description of treatment and comparison students by grade level, ESL status, and gender is represented in Table 1. The majority of students in each group were 9th or 11th graders, while the overall largest number of students across groups were in 9th grade (34%). Twelfth graders were the least represented group with an overall total of 13% across all three groups. The English as a Second Language (ESL) status was similar for all groups with approximately 3-5% of students in each condition having been designated by the school as being students with ESL or an ESL/LEP label. The majority of students in each group were male. The overall percentage of male students was 64%, while only 32% of the sample was female.

Table 1

Demographic Information

	Grade				ESL Status			Gender	
	9	10	11	12	No ESL	ESL/LEP	LEP	Female	Male
RR (N=33)	27.3% (n=9)	24.2% (n=8)	30.3% (n=10)	18.2% (n=6)	27.1% (n=26)	3.1% (n=3)	4.2% (n=4)	42% (n=14)	58% (n=19)
WR (N=34)	38.2% (n=13)	23.5% (n=8)	26.5% (n=9)	11.8% (n=4)	27.1% (n=26)	5.2% (n=5)	3.1% (n=3)	41% (n=14)	59% (n=20)
C (N= 29)	37.9% (n=11)	27.6% (n=8)	27.6% (n=8)	6.9% (n=2)	26% (n=25)	4.2% (n=4)	0% (n=0)	14% (n=4)	86% (n=25)
Total	34% (n=33)	25% (n=24)	28% (n=27)	13% (n-12)	80.2% (n=77)	12.5% (n=12)	7.3% (n=7)	33% (n=32)	67% (n=64)

Note. RR=Repeated Reading; WR=Wide Reading; C=Comparison

Exceptionality

Table 2 represents the frequency of different exceptionalities by experimental condition. Students with LD represented just over 75% of the total sample, with the RR group (67%LD) being somewhat more diverse in this respect than the WR group (82%) and C group (90%). Relatively few students in the sample represented other categories of exceptionality.

Table 2

Exceptionality

Group Assignment		Frequency	Valid Percent
RR	LD	22	66.7
	ED	1	3.0
	OHI	5	15.2
	MR	2	6.1
	AI	1	3.0
	Unknown	2	6.1
	Total	33	100.0
WR	LD	28	82.4
	ED	2	5.9
	OHI	1	2.9
	MR	2	5.9
	AUTISM	1	2.9
	Total	34	100.0
C	LD	26	89.7
	OHI	2	6.9
	Unknown	1	3.4
	Total	29	100.0

Note. RR=Repeated Reading; WR=Wide Reading; C=Comparison. LD=Learning Disability; ED=Emotional Disturbance; OHI=Other Health Impaired; MR= Mental Retardation; AI=Auditory Impairment

Materials

Reading material for the interventions was taken from the fluency series, The Six Minute Solution (Adams & Brown, 2007), Read Naturally (Ihnot, 1999, 2004), and QuickReads (Hiebert, 2006). All series were selected so there would be an adequate amount of reading material for students at each reading level. Students alternated reading text from each fluency series so that equal numbers of fluency passages across series were used across conditions. All passages were nonfiction and were selected to

correspond with the reading level of the lower reader in a pair. Expository text was selected because it represents the most common type of text secondary struggling readers are asked to read and comprehend in their content area classes. Passages ranged from approximately 175-450 words in length. The same passages were used in each condition.

Design

The investigator conducted an experimental pretest/posttest design with students randomly assigned to one of three conditions within each class. Students in 11 special education English and reading classes (n=96) were paired (or when there were odd numbers in a class, placed in trios) within classes. The primary variable of interest used to create pairs was the students' reading levels based on the students' median pre oral reading fluency (ORF) score. Within each class, students were rank ordered from the lowest median to highest median ORF scores derived from their three pretest ORF data points (Fuchs et al., 1997). Next, students were paired based primarily on instructional knowledge about the treatment. This included keeping a higher level reader with a lower one, trying to avoid too much variability so text levels could be stretched for the lower reader, but not too low for the higher reader. Although pairs were qualitatively and substantively different based on reading levels within a given group because of the method used to assign students to conditions, variability was similar across all groups. In addition, although pairing for instruction can have a positive effect by itself (Fuchs, et al., 1997), the same pairing procedures were used across both treatment conditions as a means of controlling for this effect. Additionally, students were evaluated as individual cases despite the fact that instruction took place in pairs and/or trios. In a few of the

classes where there were uneven numbers of students, trios were formed. Once pairs and trios were formed, they were randomly mixed up within classes, treating each pair or trio as a "case". Finally, the investigator randomly assigned each pair to one of three groups: repeated reading, wide reading, or the typical instruction comparison group in that order throughout all pairs and trios. Therefore, while classes varied in the number of pairs/trios assigned to each group within each class, overall the groups were dispersed fairly evenly throughout each class and the total sample. There were a total of 33 students in the repeated reading group, 34 students in the wide reading group, and 29 students in the comparison group with pre and post test data.

Students assigned to the RR condition participated in a repeated reading intervention in which students followed specific procedures to read the same text three times each day. Error correction from students' partners was incorporated into this condition. In the WR condition, students participated in a wide reading intervention in which students followed similar procedure as in the repeated reading condition, but in this condition students read text non-repetitively. Error correction from partners was incorporated into this condition. Students in the C condition served as a comparison group. Students in this condition participated in the typical instruction they would normally receive from their regular classroom teacher during the same time students in the other two conditions participated in their respective interventions. Most of the instruction found in the typical practice condition involved practice for the state test, The Texas Assessment of Knowledge and Skills (TAKS). Typically, students read and answered comprehension questions independently.

Students participated in the repeated reading and wide reading interventions daily, five times per week. Although the goal of the intervention was for students to participate in 47-55 sessions for approximately 10 weeks, students' participation ranged from 8-47 sessions (10 weeks) excluding pre and post testing weeks. Seventy nine of the students participated in 50% or more sessions (23 or above). Of the 17 students who participated in less than 23 sessions, the students were equally distributed throughout conditions. Each intervention session lasted approximately 15-20 minutes, therefore, students who participated in 47 sessions participated in approximately 15 hours of the intervention.

Data Analysis

Descriptive data were calculated for all measures. Inferential statistics were used to evaluate the significance of any differences for overall groups and for certain subgroups. Treatment effects were estimated using analysis of covariance (ANCOVA). ANCOVAs were conducted; one for each outcome measure. Results are described in more detail in the results chapter.

Power Analysis

Prior to conducting the study, a power analysis was calculated to determine (a) how large a sample was needed to allow statistical conclusions that would be accurate and reliable and (b) how likely it would be to detect significant effects in the study with a given sample size. Performing a power analysis is important so that a sample size will be large enough to detect effects and make valid conclusions based on the study effects and not too large so that resources are wasted. The following chart shows the estimated

sample size based on different measures of effect sizes. The calculations assume a power of .80, and alpha level of .05, and a correlation of .70.

d	N
.10	Total= 465 (155 per group)
.20	Total= 120 (40 per group)
.25	Total= 78 (26 per group)
.35	*Total= 45 (15 per group)*

Work in related areas report effect sizes ranging from d = -.36-.25 (Fuchs et al., 1999; Homan et al., 1993). Fuchs and colleagues (1999) report an overall effect of .25 (when converted to *d*) on the Comprehensive Reading Assessment Battery: Comprehension questions, considered small to moderate. Additionally, they report no significant effect (d = .11) on the Comprehensive Reading Assessment Battery: Oral reading fluency. While this study reflects the current study because the authors used partner reading procedures, the treatment condition differed from the proposed study because it employed a comprehension component which may have been responsible for a majority of the gains.

Homan and colleagues (1993) measured comprehension with story retellings for groups in a repeated reading condition compared to a wide reading condition and reported an effect favoring the wide reading group (d= -.36). While their findings are based on a similar treatment as the proposed study (repeated reading vs. wide reading), Homan and colleagues examined different outcomes and used measures that may have been unreliable. For example, it is not clear that story retelling represents a valid measure of comprehension (Roberts, Good, & Corcoran, 2005).

From the current study, a significant effect was expected based on the sample size at minimum at the .20 level. Although previous research on fluency interventions like the ones provided in this study with older students have not yielded clearly positive outcomes, the current study was designed to test whether intervention intensity and measurement issues may explain previous difficulties with fluency interventions. In summary, for this study students participated in a more intensive intervention that was conducted daily with a goal of at least 47 sessions for ten weeks while the students in the study by Fuchs and colleagues participated in the intervention for 40 sessions and only five times every two weeks. Students in the study by Homan and colleagues only participated in the intervention three times per week for seven weeks. Second, previously conducted studies have measured comprehension in a way that may be unreliable such as with a measure of story retell or by simply asking questions following text reading. This study measured comprehension using standardized measures for all outcome measures. In addition, this study measured word reading while some related studies have not (i.e. Fuchs et al., 1999; Homan et al., 1993; Rashotte & Torgeson, 1985). Finally, interventions in previously conducted similar studies did not always include components which have been known to increase the effectiveness of a fluency treatment. For example, while the treatment in the study by Homan and colleagues did not have an error correction component during their repeated reading condition, the current study did include this component.

Data Collection Tools

The investigator collected two types of quantitative assessment data: pre- and posttest assessments and progress monitoring data collected bi-weekly. Individuals participating in a graduate program in special education were trained to administer the measures. The investigator chose the assessment battery because it assesses a broad range of reading and reading-related outcomes and includes only measures with strong psychometric properties.

Pre-posttest data

At pre-test and posttest the investigator collected data to assess student growth in the reading domains of fluency, comprehension, and word identification. The following pre/post test measures were administered to measure variables of interest (i.e. fluency, comprehension, and word reading):

Fluency. Student improvement in reading speed was assessed via an oral reading fluency measure (ORF). Fluency was assessed using standard reading assessment passages on the 8th grade level, the closest level of oral reading fluency passages available to the students' actual grade level from the benchmark set of passages from the AIMSWeb system (Edformation, 2002). Students were given three passages on the 8th grade level at pre and posttest and the median score was used for analysis to obtain a more accurate measure of reading fluency. The oral reading fluency passages assess a child's accuracy and rate in connected text. Student performance is measured by having a student read a passage aloud for one minute. Errors are noted and the number of words correct per minute from the passage is the student's oral reading fluency rate. The

AIMSWeb probes for grade eight have reliabilities ranging from .77-.95 (Howe & Shinn, 2002).

Students were also assessed on a measure of silent reading fluency. Specifically, students were administered the Test of Silent Contextual Reading Fluency (TOSCRF) (Hammill, Wiederholt & Allen, 2006) which is a quick and reliable way to assess students' silent general reading ability. Reliabilities range from .82 to .87 for students ranging in age from 13-17. The test is unique because it measures a student's ability to silently read words and takes into account a student's ability to identify words, word meaning, sentence structure, and fluency. The TOSCRF is a group-based assessment of reading fluency that measures a student's essential contextual reading abilities (i.e., word identification, word meaning, sentence structure, comprehension, and fluency). Students are presented with short passages comprised of rows of contextually related words, ordered by reading difficulty; all words are printed in uppercase without any spaces or punctuation between the words (e.g., AYELLOWBIRDWITHBLUEWINGS). Students are asked to draw a line between the boundaries of as many recognizable words as possible within 3 minutes (e.g., A/YELLOW/BIRD/WITH/BLUE/WINGS). The passages become gradually more complex in their content, vocabulary, and grammar (embedded phrases, sequenced adjectives, affixes, etc.).

Comprehension. Students' comprehension achievement was assessed using the Woodcock-Johnson Tests of Achievement III (WJ III) Passage Comprehension subtest. The WJIII is a nationally standardized individually administered battery of cognitive and achievement tests. The Passage Comprehension subtest is a measure of reading

comprehension at the sentence level that uses a cloze procedure. The participants read the sentence or short passage and filled in missing words based on the overall context. Reliability ranges from .87 to .97. Forms A and B were alternated at each assessment point. Students were also assessed using the Test of Silent Reading Fluency (Wagner et al., 2006). The Test of Silent Reading Fluency is a group-based assessment of silent reading fluency that measures a student's essential contextual reading abilities (i.e., word identification, word meaning, sentence structure, comprehension, and fluency). Students were presented with individual sentences, ordered by reading difficulty. The sentences become gradually more complex in their content, vocabulary, and grammar. Sentences range in length from four words to ten words. Students were asked to read each sentence silently then circle "yes" if the sentence is true, or "no" if the sentence is not true. Students read as many sentences as possible within three minutes (e.g., A fish lives on land. Because the sentence is false, the student would circle the word "no"). To control for guessing, students' incorrect items were subtracted from the number of correct items.

Word Identification. Students' word identification achievement was tested using the WJ III Letter-Word Identification subtest. The two reading subtests from the WJIII were administered individually in 50 minutes sessions to all participants.

Time series data. In addition to the pre- and posttest assessment, each interventionist monitored his or her students' progress in oral reading fluency through brief assessments administered bi-weekly using the ORF progress monitoring passages from the AIMSWeb system, and with graphing of their daily practice scores done on students' third and final read in the RR condition and students' best read in the WR

condition. Students were given passages from the AIMSWeb system, the same series used at pre and posttest. During this time students read one 8th grade oral reading fluency passage.

Procedures

Training of the Interventionists

Interventionists (n=3) were employed as two graduate research assistants and one full time employee by the investigator. The investigator trained the interventionists to implement the interventions and conduct assessments. The training occurred in two three hour sessions. During the training sessions, the investigator trained the interventionists on the partner reading procedures as well as how to monitor the two treatment conditions.

Each intervention was taught separately using the following steps. First, the investigator provided instructions on the partner reading procedures for the treatment. Second, using a videotaped example of the treatment, the investigator modeled and explained each step of the partner reading procedures. Third, interventionists practiced the procedures in pairs as if they were the students while the investigator acted as the interventionist. Fourth, each interventionist practiced monitoring the intervention as they normally would while the investigator and other interventionist acted as students. The investigator used the treatment integrity checklist (Appendix B) during practice sessions to determine if the interventionists understood the partner reading procedures.

After the interventionists were trained in the student procedures, they were trained in their role as the interventionist. First, the investigator provided them with a cue card that outlined their role in the intervention. Interventionists were encouraged to follow the

cue card directly during the intervention. Third, the interventionists practiced implementing the intervention. Fourth, the investigator used the treatment integrity checklist (Appendix B) to determine if the interventionists understood their role as the interventionist. All interventionists met 100% integrity before they implemented either intervention with the students.

Obtaining Consent

Prior to conducting the study, the investigator met with personnel at the school district and individual school(s) to obtain permission to conduct the study. Once permission was obtained from the school district, school, and the Institutional Review Board at The University of Texas at Austin, parental consent and/or student assent was obtained. (Appendix C & D) The investigator and interventionists met with the eligible students and explained the purpose of the study and what would be required of them if they chose to participate. The reading teacher sent an information letter home with each of the students that provided a detailed description of the intervention and a full explanation of the study after obtaining parent consent and/or student assent. (Appendix E)

Treatment Conditions

Repeated Reading

The repeated reading method consists of repeatedly reading a short, expository passage several times with the goal of increasing the automaticity of decoding. All passages were selected because they matched the weaker reader's instructional reading level in each pair. Every day, the interventionist provided each student in the pair with a

folder containing *one* new passage. Each pair read the same passage based on the weaker reader's reading level. Each student read the passage aloud three times and followed along as the passage was read by their partner three times. Therefore, each student had six opportunities to read or listen to the passage being read for a total of six times. See Appendix F for an explanation of the repeated reading condition procedures and see Appendix G for procedures followed when groups were uneven or when there was absenteeism.

The interventionist controlled and monitored all pairs to begin and end reading so they were all reading simultaneously with each other and all other pairs in the class regardless of treatment conditions. See Appendix H for monitoring procedures. The following procedures were followed by pairs participating in the repeated reading condition:

1. Cold Read (1 minute)
    (a) The higher level reader, partner one (P1), reads the passage first, serving as a model of good reading for the lower level reader, partner two (P2).
    (b) As P1 reads the passage, P2 follows along and underlines any mistakes. Mistakes consist of words that are misread or omitted.
    (c) At the end of one minute, the interventionist instructs all P1s to stop reading.
    (d) P2 records the number of words read minus the errors to calculate a fluency score.

(e) Next, the partners switch and using the same procedures, P2 completes a "cold read' while P1 follows along and records errors.

2. Practice Read (1 minute)

   (a) P1 reads the passage and P2 underlines errors.

   (b) When the interventionist announces that one minute is up, P2 provides error correction for P1. Students were trained to follow the same error correction procedure. The error correction procedures consist of one partner pointing out which words they underlined during the practice read and reviewing them with his or her partner. P2 says: "*Here are the words I underlined. Let's read these together.*" Students then review the words together. P2 then asks: "*Are there any other words you would like to review?*" If yes, students review words and if no, students move on. (See Appendix I).

   (c) Partners switch roles and follow the same procedures. This gives P2 a chance for a practice read followed by error correction by P1.

3. Hot Read (1 minute)

   (a) The higher reader, partner one (P1) reads the passage first.

   (b) As P1 reads the passage, P2 follows along and underlines any mistakes. Mistakes consist of words that are misread or omitted.

   (c) At the end of one minute, the interventionist instructs all P1s to stop reading.

(d) P2 asks P1 to summarize what he has read. The purpose of this is so that students read at a realistic speed that they would normally read at if they were going to be responsible for attending to meaning.

(e) P2 records the number of words read minus the errors to calculate a fluency score.

(f) Next, the partners switch roles and using the same procedures, P2 completes a "hot read' while P1 follows along, asks for a summarization and records errors.

(g) Students graph the results of their respective hot reads onto their own fluency charts. (See Appendix J)

If the lower level reader in each pair was able to read 100 words per minute correct with fewer than five errors for two consecutive sessions, the reading level for subsequent sessions was raised. Students were not given lower-level passages unless the lower reader made more than two errors in every ten words.

Wide Reading

The wide reading condition consisted of each student reading three *different* short, expository passages in each session. All passages were selected because they matched the weaker reader's instructional reading level in each pair. In this condition, every day, the interventionist provided each student with a folder containing *six* new passages. Each pair read passages based on the weaker reader's reading level. Each student read a different passage aloud three times and followed along as his or her partner read three other passages three times. Therefore, each student had one opportunity to listen to a total of

six different passages. See Appendix G for procedures followed when groups were uneven or when there was absenteeism.

The interventionist controlled and monitored all pairs to begin and end reading so they all read simultaneously with each other and all other pairs in the class, regardless of treatment conditions. See Appendix H for monitoring procedures.

With one exception, the procedures for the different reads in the WR condition were identical to those used in the RR condition. The only difference is that students in the WR condition read *three different* passages each. Instead of a "cold read", a "practice read", and a "hot read", they had three "different" reads. Students still had the opportunity for error correction during the second read. Students asked their partners to summarize what they read after the last read to encourage students to read at a realistic pace as they would read any text they are responsible for attending to its meaning. Students graphed the results of their best read. See Appendix K for an explanation of the WR condition procedures.

If the lower level reader in each pair was able to read 100 words per minute correctly with fewer than five errors for two consecutive sessions, the reading level for subsequent sessions was raised. Students were not given lower-level passages unless the lower reader made more than two errors in every ten words.

Typical Instruction Comparison Condition

Students assigned to the comparison condition worked with their regular classroom teachers. The teachers provided the typical instruction they would normally provide to all the students in their classes during the time the interventions were taking

place each day. Informal observations with anecdotal notes were conducted for each group as well as a teacher interview with the investigator. The most prevalent activities observed included independent seat work with little or no feedback. A sample of a descriptive instrument for the documentation of supplemental reading instruction for the students in the study is in Appendix L.

Treatment Integrity

A crucial element of scientifically based research is evidence of the use of a fidelity of treatment check. Also known as treatment integrity, fidelity of treatment describes the intervention in sufficient detail to allow for replication and provides confidence that the findings are related to the intervention as specified. Descriptions of how fidelity of treatment is assessed improve our confidence that the intervention was implemented with "accuracy and consistency" (Gresham, MacMillan, Beebe-Frankenberger & Bocian, 2000, p.198). Poor treatment integrity can compromise the validity of an experiment.

Fidelity Measure

Procedures and Results from Fidelity Data. Each interventionist was observed by the investigator three times using the same treatment integrity checklist that was used for training purposes (Appendix B) to determine the extent to which the interventions were implemented as planned. If the interventionist taught several classes, the investigator rotated between the classes in which she was recording fidelity data. Treatment integrity was calculated as the number of items on the checklist completed correctly divided by the total number of items on the checklist, multiplied by 100. Using the Treatment Integrity

Checklist (See Appendix B), the interventionist observed each investigator for the duration of the intervention. Fidelity for interventionists ranged from 91%-100%. In cases where fidelity was less than 100%, teachers were provided feedback to increase the chances of reaching 100% fidelity in the future.

CHAPTER 4

Results

This study was conducted to examine the relative effectiveness of a Repeated Reading (RR) and Wide Reading (WR) intervention when compared to a typical instruction comparison group (C) on secondary struggling readers' word recognition, comprehension, and fluency ability. Ninth through twelfth grade students in special education reading and English classrooms qualified for this study. Intervention was provided daily for approximately 15-20 minutes for 10 weeks. Students were paired within classes and randomly assigned to one of three groups: RR, WR, or the C group. Five measures of reading were administered prior to and after the intervention.

Primary Questions

The following primary questions were addressed:

1. What is the relative effect of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on reading comprehension?
2. What is the relative effect of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on reading fluency?
3. What is the relative effectiveness of repeated reading, wide reading, and a typical instruction comparison group on students' outcomes on word reading?

Data Analysis

The results are organized into 2 main sections. The first section summarizes results of descriptive analyses and provides information about the pre and posttest measures. The second section describes outcomes of a series of analyses of covariance

(ANCOVA) addressing the primary research questions, which were used to evaluate the statistical significance of group differences. Given the small sample size in terms of doing omnibus testing, family-wise error rate was not controlled (although this should be noted as a limitation), a decision discussed in more detail in the discussion section of this dissertation. To gather more exploratory information, inferential tests were also performed on several secondary subgroup analyses. While these additional analyses pose the risk of increasing the likelihood of committing a Type 1 error, there are several compelling reasons to perform these analyses. I hypothesized that the intervention results possibly differed according to specific factors related to the ability of particular students in the sample (i.e., reading accuracy levels). Despite the small sample sizes for each subgroup, I conducted these further analyses to confirm or disconfirm possible areas for future research. Therefore, the secondary analyses should be interpreted as a way to further examine the results of the intervention; however, the results should be interpreted with caution. Effect sizes (ES) and standard errors of measurement (SEM) for subgroups of interest are provided as an extension of the ANCOVA findings.

Descriptive Information on Outcome Measures

Pre and posttest standard score means and standard deviations are reported in Table 3 for the three groups for the following outcome measures: Woodcock Johnson Letter Word Identification (WJ-III LWID) and Comprehension (WJ-C) subtests. Pre and posttest raw score means and standard deviations are reported for the Test of Silent Reading Efficiency (TOSRE) because standard scores were unavailable. There were no statistical differences on pre-test measures. The average WJ-III LWID pretest score for

the total sample was 72.07 and scores ranged from 70.97 in the WR group (N= 34) to 73.97 in the C (N=29) group. Pretest scores were somewhat more varied for the WJ-C, ranging from an average of 65.50 in the WR group to 71.14 in the C group. The overall average for WJ-C was 68.34. Most standard scores on the WJ were approximately 2 standard deviations below the mean on the pretest and the posttest, and students made only small average gains in several areas (e.g. repeated reading). The average TOSRE score for the total sample was 12.59. The scores for the treatment groups ranged from 10.62 to 14.52.

Table 3

Word Reading and Comprehension Pretest and Posttest Standard Scores

	Pre		Post	
	M	SD	M	SD
RR (N=33)				
WJ-LWID	71.27	(17.32)	72.61	(15.49)
WJ-C	68.39	(18.22)	71.88	(14.21)
TOSRE*	12.63	(5.55)	13.86	(5.78)
WR (N=34)				
WJ-LWID	70.97	(16.94)	71.70	(16.30)
WJ-C	65.50	(19.18)	70.40	(14.98)
TOSRE*	10.62	(5.73)	13.24	(6.70)
C (N=29)				
WJ-LWID	73.97	(15.72)	73.48	(16.38)
WJ-C	71.14	(20.58)	73.48	(18.04)
TOSRE*	14.52	(7.26)	15.92	(7.42)
Total=96				

Note. *Raw scores only; standard scores not available. RR=Repeated Reading; WR=Wide Reading; C=Comparison; WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSRE=Test of Silent Word Reading Efficiency

In Table 4, the words correct per minute (WCPM) pre and posttest means and standard deviations are reported for the three groups for the AIMSWeb oral reading fluency measure. The pre and posttest standard score means and standard deviations are

reported for the Test of Silent Contextual Reading Fluency (TOSCRF). Students took the same 3 AIMSWeb one minute oral reading fluency measures at the 8th grade level for pre and posttest. Median scores are used for the analysis. There were no statistically significant differences on pretest measures. On the AIMSWeb ORF measure, pre-test scores ranged from 73.29 in the WR group to 80.66 in the C group. Students in the RR (N= 33) group were virtually equivalent to students in the C group with a pre-test mean of 80.33. It is important to note, however, that standard deviations were quite large ranging from 32.31 to 41.85. Students in the RR and WR groups made an average gain of 3 words per minute, while students in the C group made an average word gain of 6 words per minute. On the TOSCRF, pre-test differences ranged from 68.81 in the WR group to 75.18 in the RR group. Standard deviations were also large ranging from 10.64 to 17.36.

Table 4

Reading Fluency Pretest and Posttest Words Correct Per Minute and Standard Scores

	Pre		Post	
	M	SD	M	SD
RR (N=33)				
AimsWeb1	83.21	(42.92)	86.12	(40.25)
AimsWeb2	80.33	(37.14)	82.67	(38.88)
AimsWeb3	77.61	(38.92)	83.21	(39.38)
TOSCRF (N=33)	75.18	(12.38)	77.67	(13.16)
WR (N=34)				
AimsWeb1	74.09	(35.64)	83.34	(38.93)
AimsWeb2	73.29	(32.31)	76.48	(33.56)
AimsWeb3	69.24	(29.83)	72.66	(31.92)
TOSCRF (N=25)	68.81	(17.36)	73.56	(16.68)
C (N=29)				
AimsWeb1	83.79	(44.88)	91.62	(48.39)
AimsWeb2	80.66	(38.84)	86.28	(41.85)
AimsWeb3	78.21	(40.15)	78.86	(41.21)
TOSCRF (N-28)	74.07	(10.64)	77.18	(14.41)
Total=96				

Note. RR=Repeated Reading; WR=Wide Reading; C=Comparison. AimsWeb=AimsWeb Oral Reading Fluency; TOSCRF=Test of Silent Contextual Reading Fluency

As a check on the success of group randomization, between group differences in pretest scores were evaluated using a series of one-way analyses of variance. There were no statistically significant differences in pre-test scores across the groups, with p-values ranging from .11 to .60 (see Table 5). Nonetheless, pretest measures for each of the dependent variables were used as covariates to increase the power of the between-group comparisons. The treatment condition was the independent variable. The AIMSWeb adjusted means were determined using the median pretest score in each group out of all three ORF measures and using the same ORF measure for posttest analysis.

Table 5
Pre-Test Group Differences

Measure	df	F	p
AIMSWeb	2,86	.76	.47
WJ-R	2,68	.52	.60
WJ-C	2,86	1.05	.36
TOSCRF	2,84	1.75	.18
TOSRE	2,81	2.25	.11

Note. AimsWeb=AimsWeb Oral Reading Fluency; WJ-R=Woodcock Johnson Word Recognition; WJ-C=Woodcock Johnson Comprehension; TOSCRF=Test of Silent Contextual Reading Fluency; TOSRE=Test of Silent Word Reading Efficiency

Analysis of Intervention Effects

To evaluate the overall group differences in the posttest means, three ANCOVA analyses were conducted; one for each outcome measure. ANCOVA is appropriate in this case because it accommodates more than two groups and "adjusts" outcomes according to differences in pretest scores. Several assumptions apply to ANCOVA. While relatively

robust to violations, ANCOVA nonetheless assumes that groups (i.e., levels of the independent variable) have similar variances (Stevens, 1999). Homogeneity of regression (the assumption that the correlation of the independent variable and the covariate is equal for all levels of the independent variable) also applies and was evaluated by considering the interaction of the covariate(s) and independent variable (Stevens, 1999). Levene's test of equality of error variances showed that the assumption of homogeneity of variances was met for all dependent measures.

Main effects for each outcome are summarized in Table 6. There were no statistical differences due to treatment. The overall adjusted mean for all groups was 85.00 (N=89). Adjusted group means (i.e. adjusted for pretest differences) for the AIMSWeb measure are similar, ranging from 83.82 in the RR group (N=33) to 85.78 in the WR group (N=34). Adjusted post test means for the WJ-R ranged from 71.51 in the C group (N=29) to 73.15 in the WR group (N=34) $F(2,88)=.65$; $p=.53$, while the adjusted means for WJ-C ranged from 71.12 for the C group (N=33) to 72.62 in the WR group (N=34) $F(2,87)=.16$; $p=.85$. For the TOSCRF, adjusted pretest means ranged from 70.15 in the C (N=28) group to 73.33 in the WR group (N=25) $F(2,74)=.314$; $p=.73$. For the TOSRE, adjusted means ranged from 75.60 in the RR group (N=33) to 77.44 in the WR group (N=34) $F(2,82)=.50$; $p=.61$.

While the differences in adjusted posttest scores are relatively small and not statistically significant, the overall trend favors the 2 treatment groups with the C group having slightly lower means than the WR group. This contrasts with the descriptive results (i.e. unadjusted post test scores), where the C group generally outscored the others

on posttest measures, due apparently to their higher performance prior to the beginning of the treatment.

Table 6
Adjusted Pre-Test Mean Differences

Measure	F	Df	P	Adjusted Means		
				C	RR	WR
AIMS	.16	2,85	.85	85.40	83.82	85.78
WJ-R	.65	2,88	.53	71.51	73.02	73.15
WJ-C	.16	2,87	.85	71.12	71.86	72.62
TOSCRF	.314	2,74	.73	14.84	13.72	14.48
TOSRE*	.50	2,82	.61	76.16	75.60	77.44

Note. *Raw scores used; standard scores unavailable. AimsWeb=AimsWeb Oral Reading Fluency; WJ-R=Woodcock Johnson Word Recognition; WJ-C=Woodcock Johnson Comprehension; TOSCRF=Test of Silent Contextual Reading Fluency; TOSRE=Test of Silent Word Reading Efficiency

Effect Sizes

Effect sizes were calculated for each measure (see Table 7). The effect size, Cohen's *d*, was calculated as the difference between the mean posttest score of the participants in the intervention condition minus the mean posttest score of the participants in the comparison condition divided by the pooled standard deviation. Effect sizes can be interpreted as $d = 0.20$ as small, $d = 0.50$ as medium, and $d = 0.80$ as a large effect (Cohen, 1988).

Effect sizes ranged from d= -.26 to d=.28, usually hovering around no effect or favoring the comparison conditions vs. the treatment conditions or the repeated reading condition over the wide reading condition. This does not take into account the effect sizes for the TOSRE measure which is still a measure experimental in nature. Because the confidence intervals for nearly all comparisons often spanned zero, it is important to interpret these effects with caution as they may not differ significantly from zero.

Table 7

Pretest to Posttest Standardized Mean Difference Main Effects

Measure	RR vs C	WR vs C	RR vs WR
WJ-LWID	ES= -.05 (-.55 to .44)	ES= -.11 (-.60 to .39)	ES= .06 (-.42 to .54)
WJ-C	ES= -.10 (-.60 to .40)	ES= -.20 (-.69 to .30)	ES=.10 (-.38 to .58)
AIMS	ES= -.08 (.25 to -.57)	ES= -.26 (.25 to -.75)	ES= .18 (-.30 to .66)
TOSCRF	ES= .28 (-.23 to .78)	ES= -.01 (-.51 to .48)	ES= .28 (-.25 to .80)
TOSRE	ES= -.31 (-.81 to .19)	ES= -.81 (-1.31 to -.28)	ES= .10 (-.38 to .58)

Note. AimsWeb=AimsWeb Oral Reading Fluency; WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSCRF=Test of Silent Contextual Reading Fluency; TOSRE=Test of Silent Word Reading Efficiency

Additional Analyses: Further Examination of Findings

In addition to the main effects analysis on measures of word recognition, comprehension and fluency, several interactive effects were evaluated, based on substantive theory and the results of prior research. The following variables were considered: level of accuracy and level of accuracy plus rate.

Subgroup Analysis: Analysis Based on Word Reading Accuracy

One element of reading that varied considerably for students participating in this study was students' word reading accuracy. A "prerequisite" to reading fluently is being able to accurately decode words. Because students' levels of reading accuracy varied considerably, I examined how accuracy was associated with reading outcomes. To accomplish this goal, students who read with at least 95% accuracy on their median pre-test ORF passage were placed into an accurate reader group while students who read with 94% or lower accuacy were placed into a less accurate group. Because accuracy based on fluency was used to group these students, fluency scores (AIMSWeb and TOSCRF) were not included as dependent variables. Student outcomes are reported for each measure in Table 8.

Table 8

Pretest and Posttest Standard Scores by Accuracy Levels

	High RR ≥95% accuracy (N=11)				Low RR ≤94% accuracy (N=21)			
Condition 1	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE*	63.36	(2.84)	64.09	(2.12)	54.95	(18.52)	60.95 (N=19)	(3.42)
WJ-LWID	84.75	(9.75)	84.00	(10.42)	63.00	(15.30)	65.76 (N=21)	(13.86)
WJ-C	76.82	(13.73)	79.55	(11.70)	63.38	(19.06)	66.60 (N=20)	(13.07)

	High WR ≥95% accuracy				Low WR ≤94% accuracy TOSRE(N=17), WJ-R (N=18),WJ-C (N=18)			
Condition 2	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE* (N=10)	62.40	(4.62)	64.10	(3.14)	59.82	(5.89)	60.65	(3.59)
WJ-LWID (N=12)	82.00	(13.74)	86.0	(10.76)	61.22	(14.36)	61.47	(11.70)
WJ-C (N=12)	72.08	(17.19)	80.42	(11.91)	57.61	(18.76)	62.94	(13.13)

	High C ≥95% accuracy (N=17)				Low C ≤94% accuracy (N=17)			
Condition 3	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE*	63.76	(2.75)	64.59	(3.43)	60.31	(6.29)	61.90 (N=10)	(3.41)
WJ-LWID	82.65	(10.78)	81.88	(12.48)	62.00	(12.84)	61.58 (N=12)	(13.89)
WJ-C	81.53	(13.26)	84.18	(9.05)	57.77	(20.19)	58.33 (N=12)	(16.80)

Note. Note. *Raw scores used; standard scores unavailable. RR=Repeated Reading; WR=Wide Reading; C=Comparison. WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSRE=Test of Silent Word Reading Efficiency

In Table 9, an F value for the effect of treatment dependent on student accuracy on the median AIMSWeb ORF measure along with the df, and p-value are presented. A small significant effect (p=.04) was found on the letter word identification subtest of the Woodcock Johnson III.

Table 9

Adjusted Mean Differences: Levels of Word Reading Accuracy

Measure	F	Df	P	Adjusted Means					
				C		RR		WR	
				≥95%	≤94%	≥95%	≤94%	≥95%	≤94%
TOSRE	.226	2,77	.80	63.99	61.71	63.59	61.74	63.82	60.96
WJ-LWID	3.26	2,83	.04	72.77	69.69	72.59	72.77	77.42	69.64
WJ-C	1.33	2,82	.27	76.58	64.28	74.49	69.54	77.92	67.91

Note. WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSRE=Test of Silent Word Reading Efficiency

Figures 1-3 show a visual display of students' performance contrasting high and low accuracy performance in the RR condition for each measure.

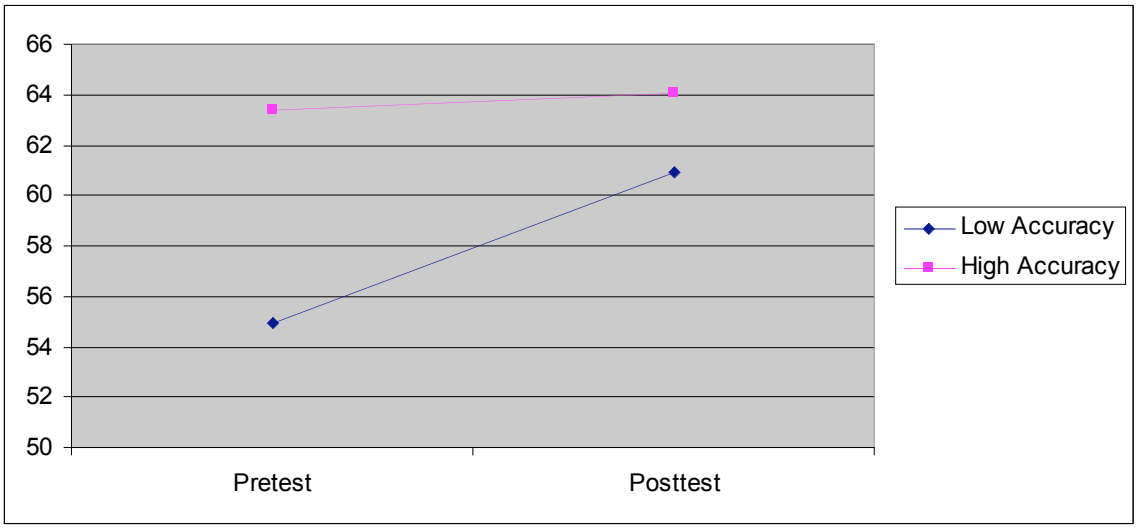

Figure 1. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within RR: TOSRE.

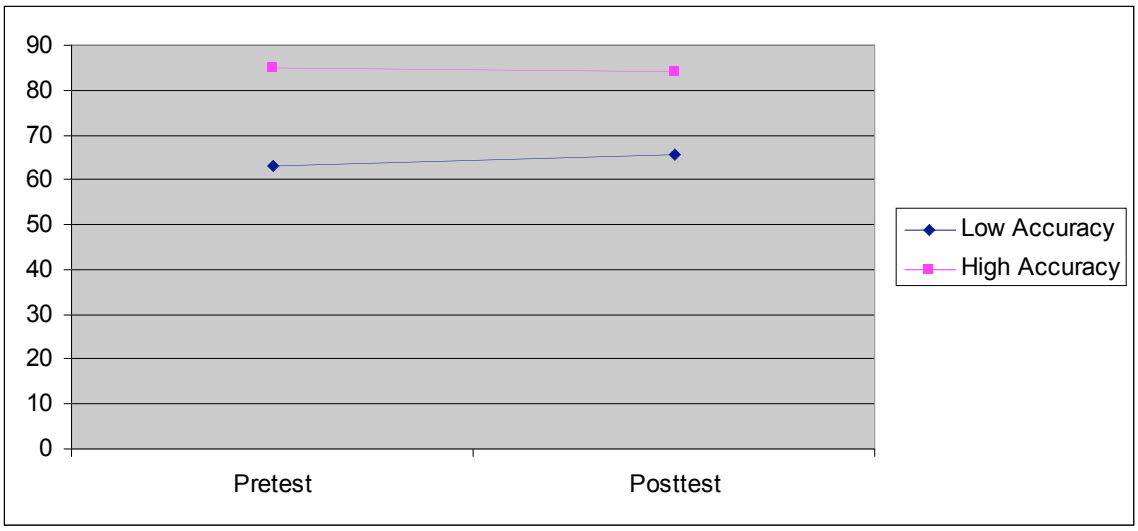

Figure 2. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within RR: WJ-LWID.

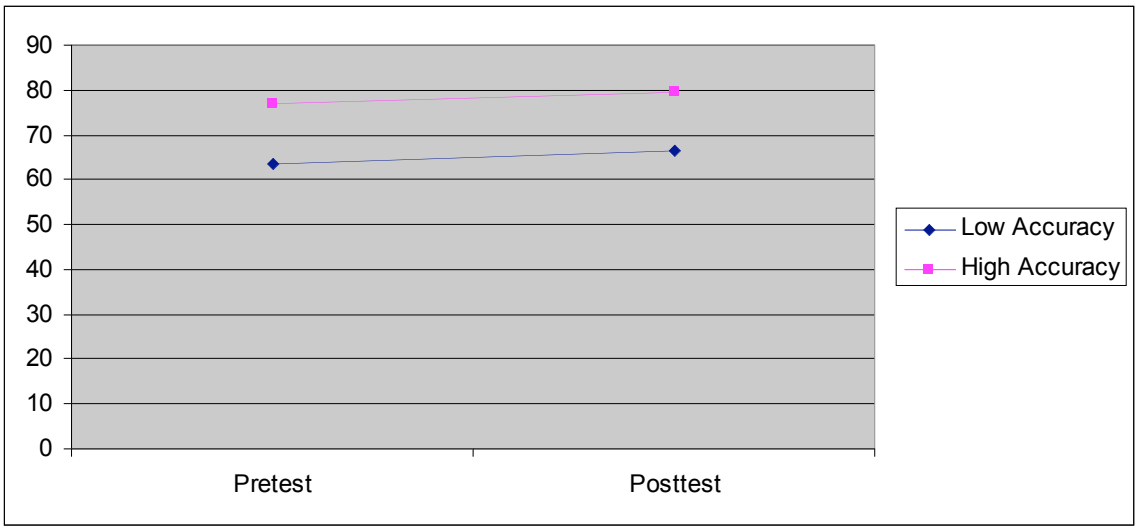

Figure 3. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Group within RR: WJ-C

To summarize, the visual display indicates that when high accuracy readers in the RR condition are compared with low accuracy readers in the RR condition, the high accuracy group consistently has higher mean standard scores on all measures at pretest and posttest than the lower accuracy group, suggesting a benefit of being a more accurate reader. The visual display of the slope indicates a slightly greater benefit for students in the low accuracy group on the TOSRE measure.

Figures 4-6 show a visual display of students' performance contrasting high and low accuracy performance in the WR condition for each measure.

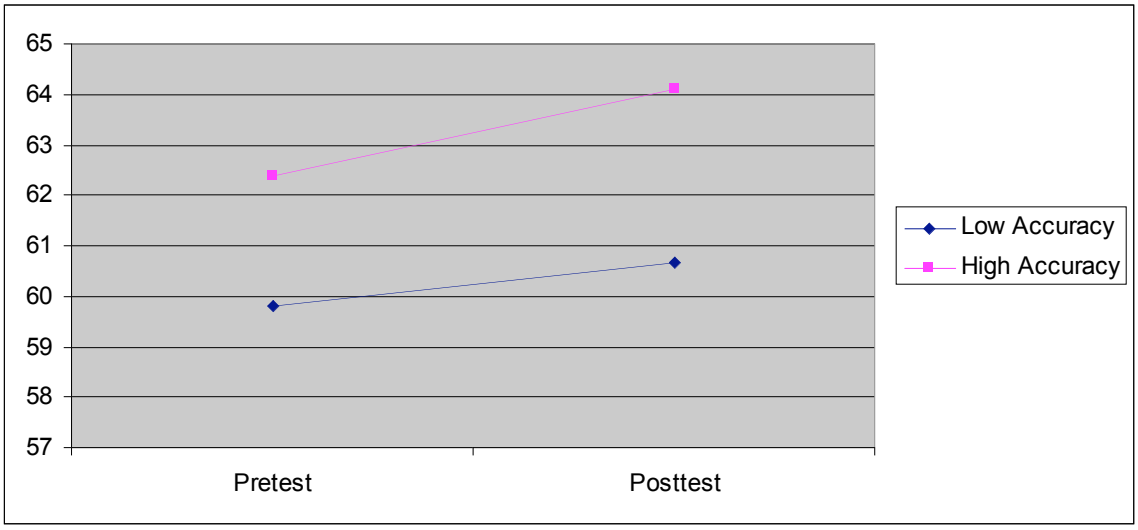

Figure 4. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within WR: TOSRE.

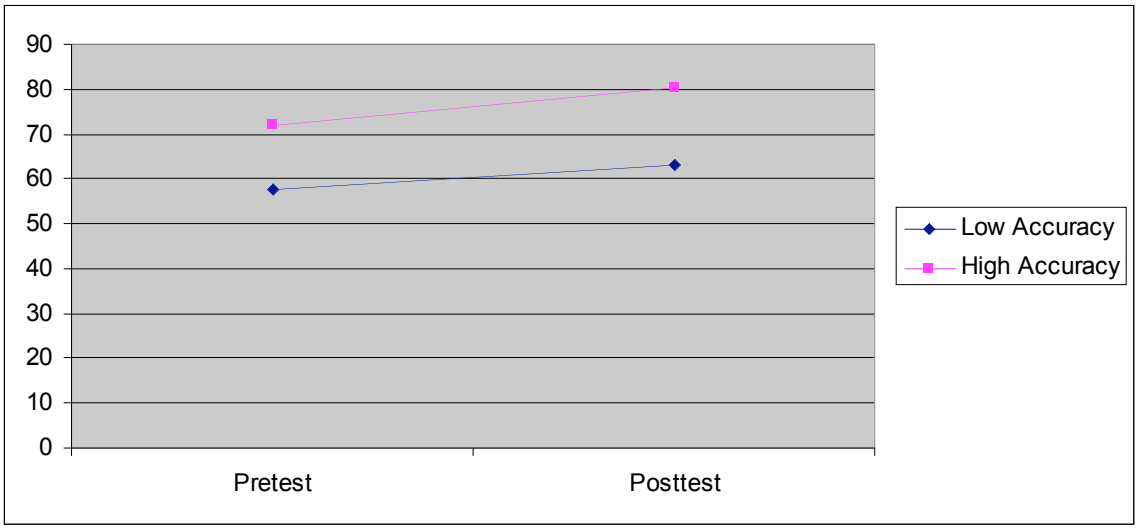

Figure 5. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within WR: WJ-LWID

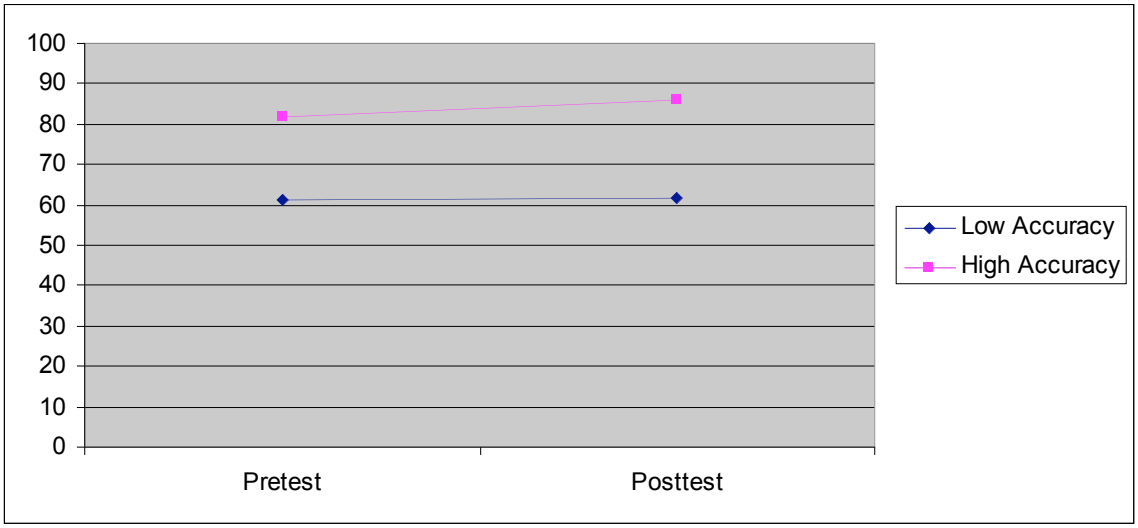

Figure 6. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Group within WR: WJ-C

To summarize, when high accuracy readers in the WR condition are contrasted with low accuracy readers in the WR condition, there are similar trends for students in the WR group as compared to students in the RR group. The high accuracy group consistently has higher mean standard scores on all measures at pretest than the lower accuracy group. The slope of the line on the TOSRE measure in the WR condition indicates slightly greater gains for the high accuracy group. This contradicts the trend shown on the TOSRE measure in the RR group which shows more gain for the low accuracy group.

Figures 7-9 show a visual display of students' performance contrasting high and low accuracy performance in the C condition for each measure.

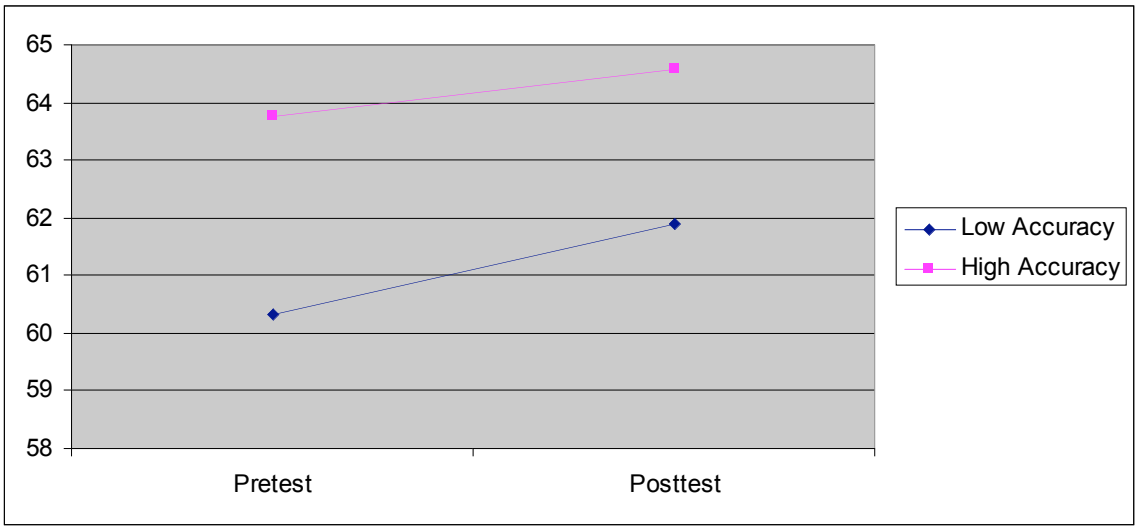

Figure 7. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within C: TOSRE

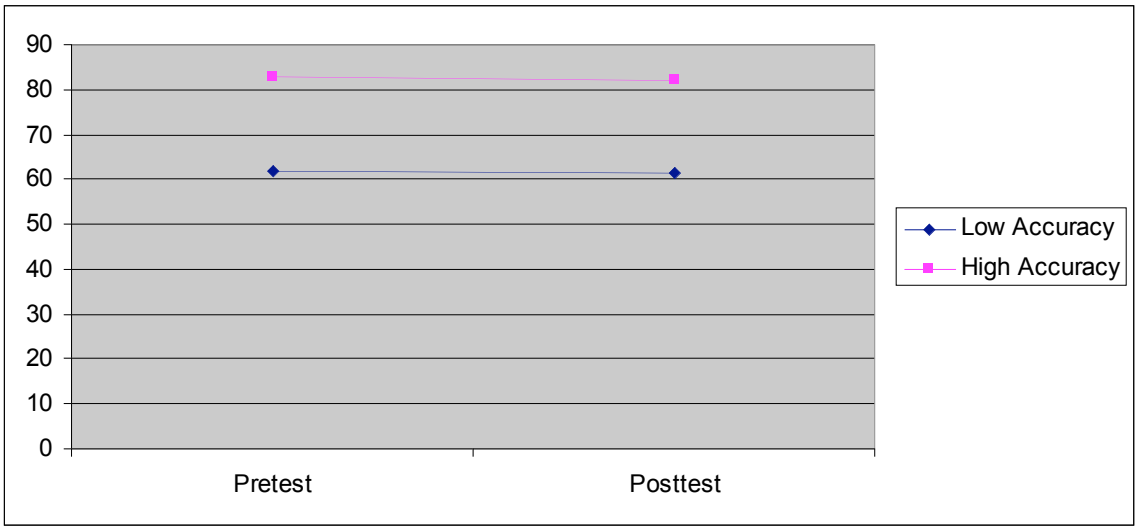

Figure 8. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Groups within C: WJ-LWID

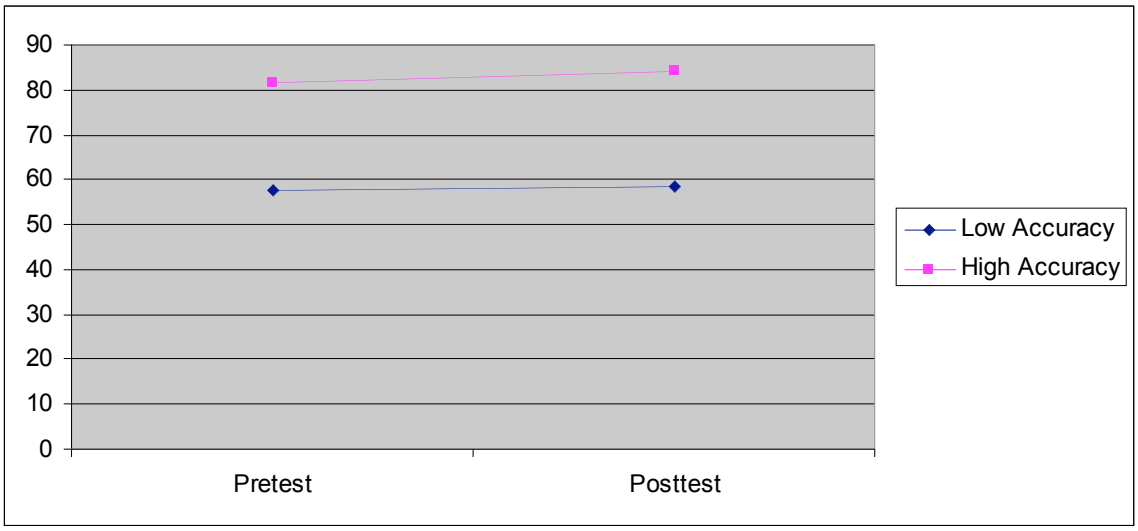

Figure 9. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Groups Compared to Lower Accuracy Group within C: WJ-C

The visual display indicates that when high accuracy readers in the C condition are contrasted with low accuracy readers in the C condition, the high accuracy group consistently has higher mean standard scores on all measures at pretest than the lower accuracy group which is especially evident on the TOSRE measure. Similar to students in the RR group, the visual display of the slope suggests a slightly greater benefit for students in the low accuracy group on the TOSRE measure.

To summarize, the trend is for students who read more accurately to demonstrate higher mean standard scores on measures of word identification and comprehension at pre and posttest. Growth pattern trends are consistently similar in that they are fairly flat across measures within groups. The greatest growth differences are shown on the TOSRE measure across condition; however, findings are inconsistent regarding which type of reader (high or low accuracy) made greater gains on this measure.

Subgroup Analysis: Analysis Based on Accuracy and Rate

In addition to levels of accuracy, students also varied on reading rate. To determine if overall effects differed for students whose scores demonstrated high and low reading rate and accuracy, students' accuracy and rate scores were examined. Specifically, students who read with at least 95% accuracy and who scored greater than or equal to 100wpm on their median pre-ORF score were placed in a high accurate and high fluent reading group. All other students were placed in another group. Because fluency was used to group these students, fluency scores (AIMSWeb and TOSCRF) were not included as dependent variables. Student outcomes are reported for each measure in Table 10.

Table 10

Pretest and Posttest Standard Scores by Accuracy and Rate

	High RR ≥95% accuracy and ≥100wpm (N=7)				Low RR ≤94% accuracy and ≤99 wpm (N=25)			
	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE*	64.86	(1.95)	64.71	(1.98)	55.88	(17.06)	61.30 (N=23)	(3.26)
WJ-LWID	89.71	(6.82)	87.71	(7.93)	65.40	(15.49)	67.64 (N=25)	(14.06)
WJ-C	81.14	(6.31)	82.57	(7.32)	64.32	(19.00)	67.88 (N=24)	(13.69)

	High WR ≥95% accuracy and ≥100wpm				Low WR ≤94% accuracy and ≤99wpm TOSRE (N=21), WJ-R (N=23), WJ-C (N=23)			
	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE*	62.00 (N=6)	(5.87)	65.17	(2.71)	60.43	(5.50)	61.00	(3.55)
WJ-LWID	84.71 (N=7)	(14.98)	89.57	(5.71)	64.90	(15.44)	65.91	(14.68)
WJ-C	71.00 (N=7)	(21.36)	80.29	(14.29)	61.09	(18.43)	66.95	(14.30)

	High C ≥95% accuracy and ≥100wpm (N=10)				Low C ≤94% accuracy and ≤99wpm (N=20)			
	Pre		Post		Pre		Post	
	M	SD	M	SD	M	SD	M	SD
TOSRE*	64.80	(2.78)	66.40	(2.59)	61.00	(5.22)	61.94 (N=17)	(3.09)
WJ-LWID	85.60	(8.15)	86.60	(6.95)	67.75	(14.97)	66.58 (N=19)	(15.73)
WJ-C	82.30	(9.48)	85.60	(5.50)	65.70	(22.03)	67.11 (N=19)	(19.15)

Note. *Raw scores used; standard scores unavailable; RR=Repeated Reading; WR=Wide Reading; C=Comparison. WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSRE=Test of Silent Word Reading Efficiency

In Table 11, an F value for the effect of treatment dependent on student accuracy *and* rate on the median AIMSWeb ORF measure along with the df , p-value, and eta squared is reported. There were no significant effects detected across measures.

Table 11

Adjusted Mean Differences: Levels of Accuracy Plus Rate

Measure	F	Df	P	Adjusted Means					
				C		RR		WR	
				High	Low	High	Low	High	low
TOSRE	1.00	2,77	.37	65.57	61.73	63.88	61.97	64.98	61.17
WJ-LWID	2.43	2,83	.10	74.99	69.64	72.71	72.72	78.69	71.01
WJ-C	.380	2,82	.69	76.68	68.42	74.34	70.42	78.15	70.39

Note. High= > or equal to 95 % accurate AND > or equal to 100wpm. Low= < or equal to 94% accurate AND < or equal to 100wpm. WJ-LWID=Woodcock Johnson Letter Word Identification; WJ-C=Woodcock Johnson Comprehension; TOSRE=Test of Silent Word Reading Efficiency

Figures 10-12 show a visual display of students' performance contrasting high and low accuracy and rate performance in the RR condition for each measure.

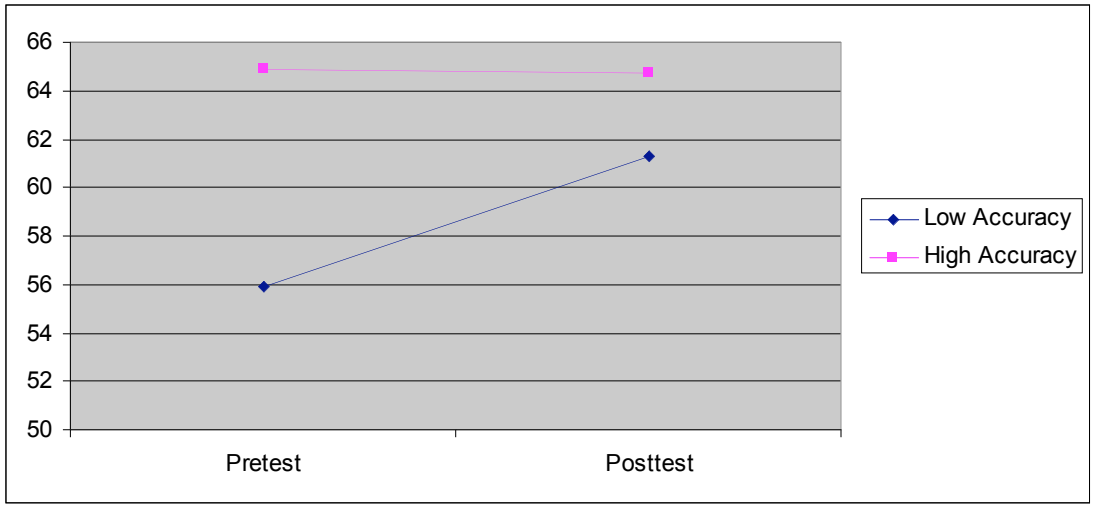

Figure 10. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within RR: TOSRE

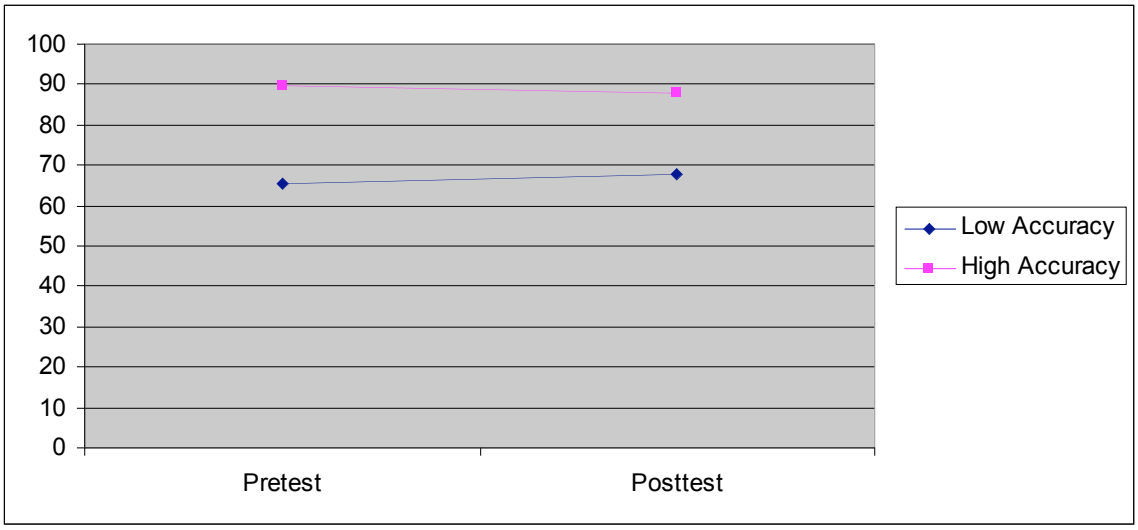

Figure 11. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within RR: WJ-LWID

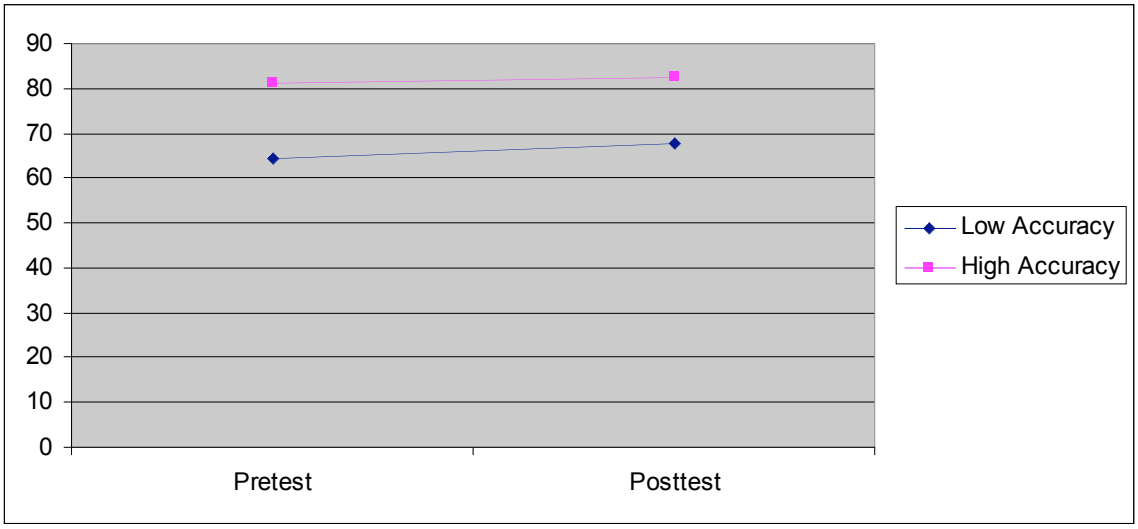

Figure 12. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within RR: WJ-C

To summarize, when high accuracy and fluent readers are compared with low accuracy and fluent readers, the higher group consistently has higher mean standard scores on all measures at pretest and posttest than the lower accuracy group, indicating a benefit of being a more accurate and fluent reader. The visual display of the slope shows greater gains for the low accuracy and rate group on the TOSRE measure. This is consistent with the findings in the previous analysis for students in the RR condition on the TOSRE for students who were in the more accurate group only.

Figures 13-15 show a visual display of students' performance contrasting high and low accuracy and rate performance in the WR condition for each measure.

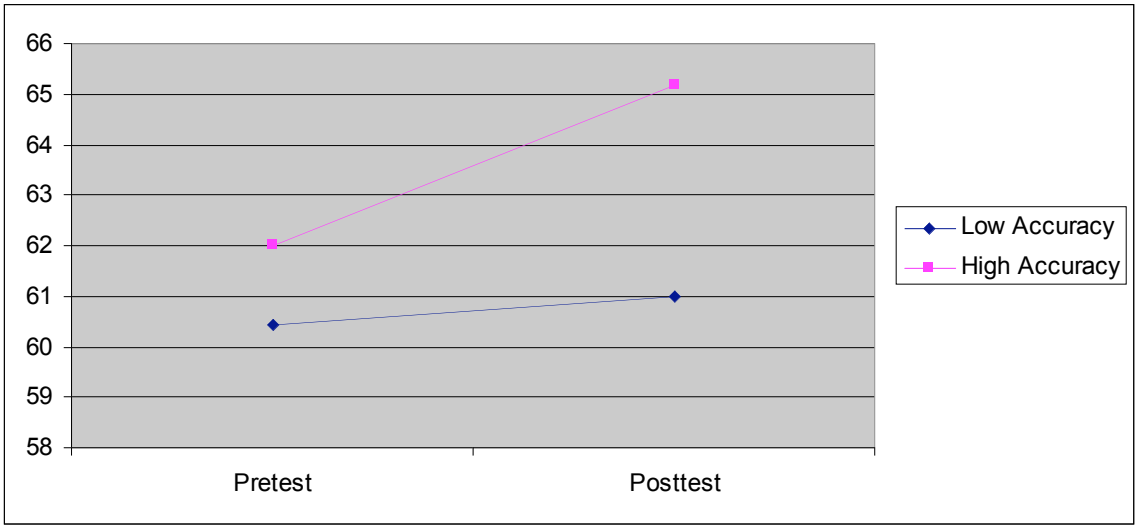

Figure 13. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within WR: TOSRE

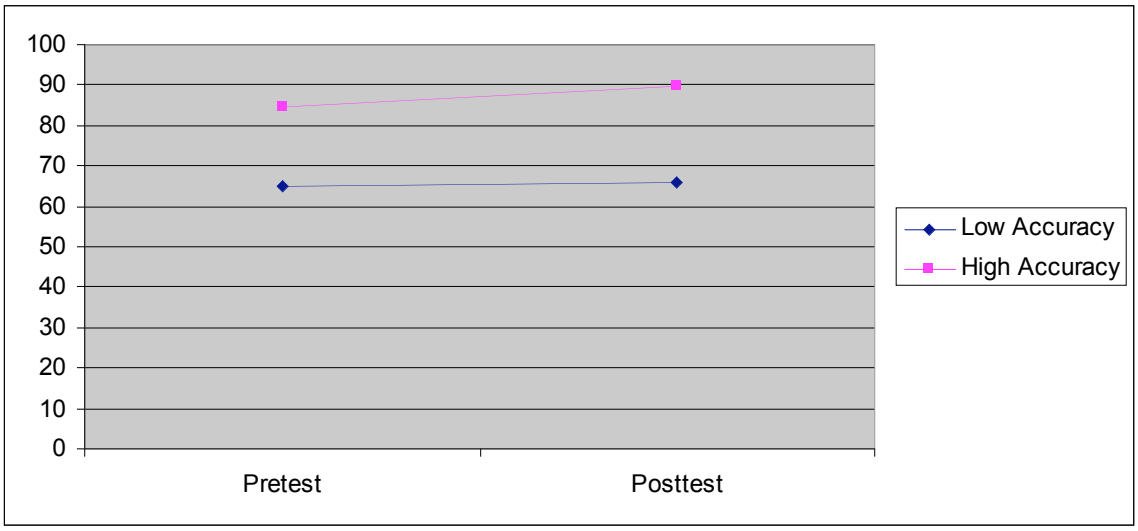

Figure 14. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within WR: WJ-LWID

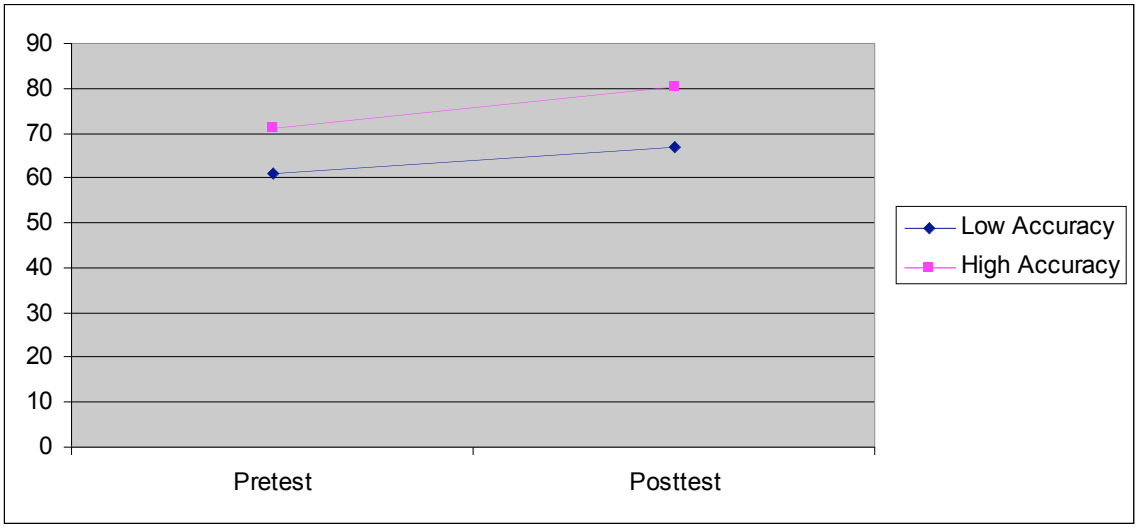

Figure 15. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within WR: WJ-C

Findings are very similar to the previous analysis for students in the subgroup based on accuracy only. Again, most gains are shown on the TOSRE measure, but

instead of being for the lower accuracy and rate group, gains are for the higher accuracy and rate group.

Figures 16-18 show a visual display of students' performance contrasting high and low accuracy and rate performance in the C condition for each measure.

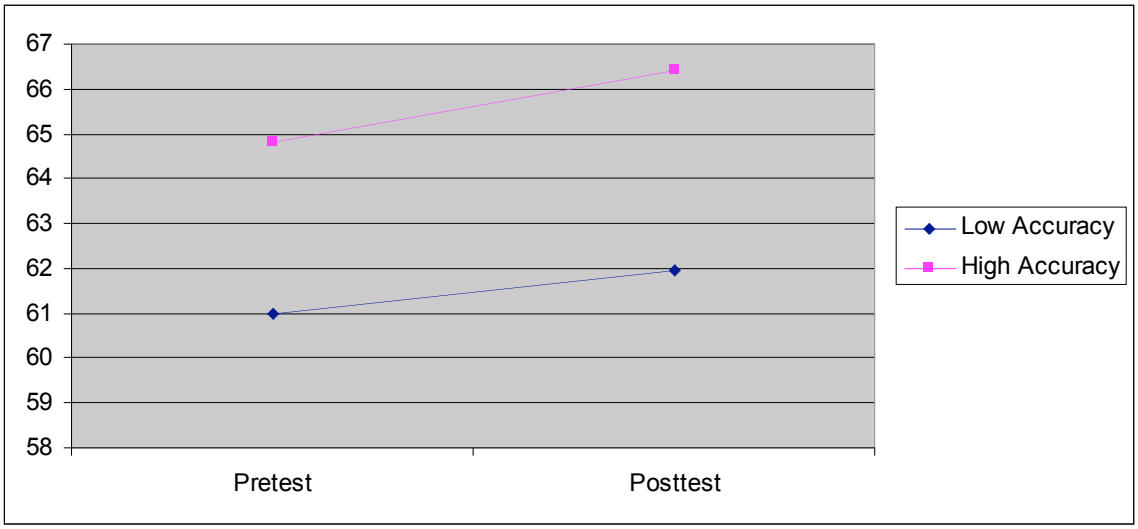

Figure 16. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within C: TOSRE

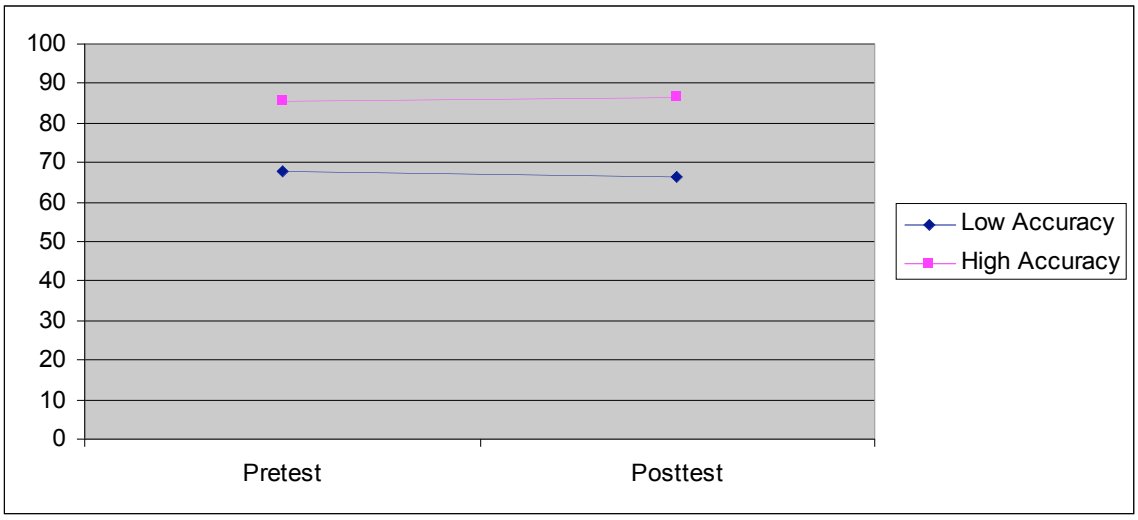

Figure 17. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within C: WJ-LWID

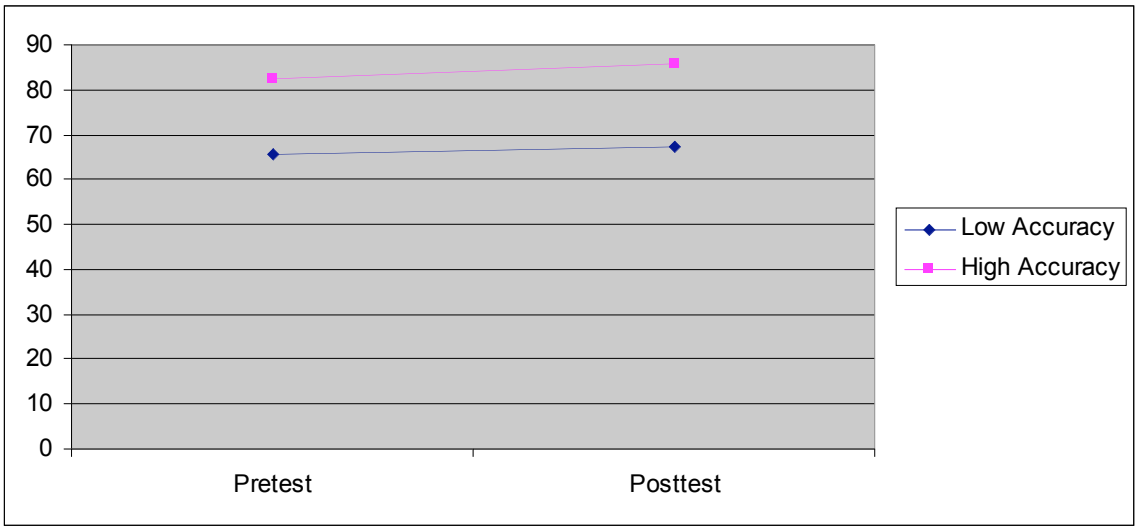

Figure 18. Pre-test and Post-test Mean Standard Scores for Higher Accuracy Plus Rate Groups Compared to Lower Accuracy Plus Rate Group within C: WJ-C

Again, the largest pretest differences and gains are reflected on the TOSRE measure. Within the C group, students in the higher accuracy and rate group show greater gains on the TOSRE measure.

In summary, students who were more accurate and fluent readers consistently show higher pre and post test mean standard scores than readers who are less accurate and slow, indicating value in being a more accurate and fluent reader. In addition, the slopes indicate fairly flat gains within groups on all measures except TOSRE. On the TOSRE measure, results reflect the previous analysis of the subgroup of accurate and less accurate readers. Students in the lower accuracy and rate group made greater gains within the RR group compared to higher accurate and fluent readers in the RR group. The finding was opposite for students in the WR group.

CHAPTER 5

Discussion

Approximately 70% of adolescent students are struggling with reading and learning from text (Biancorosa & Snow, 2004). These students are making inadequate progress on the National Assessment of Educational Progress (NAEP) and progress for these students over the past 15 years has been minimal with no change in the percentage of eighth graders scoring at or above a proficient level between 1992 and 2005 (NAEP, 2005). Furthermore, many students are unable to adequately learn from content area texts (RAND Reading Group, 2004).

Fluency is one of the critical components of reading considered an indicator of word reading and comprehension (NRP, 2000). Good readers are able to read with appropriate speed, accuracy, and proper expression. Students who read fluently generally exhibit better comprehension than those who do not read fluently (Fuchs, et al., 2001). Therefore, fluency can be considered a high priority to target because it is associated with improved outcomes and provides access to other high priority outcomes such as comprehension. This study was designed to address some of the unanswered questions about how to improve fluency and comprehension for adolescent students with reading disabilities.

In this study, older students with significant reading disabilities were assigned to one of three groups: repeated reading, continuous wide reading, or a comparison group. Overall, results of the repeated reading and continuous reading yielded no significant effects for word recognition, fluency, or comprehension. Neither fluency intervention

(RR or WR) proved to be beneficial when contrasted to a comparison group of struggling readers.

Findings Linked to Research Questions

This study addresses the need for evidenced-based research in the area of fluency intervention for older readers with reading difficulties and disabilities by examining the effects of two specific types of fluency interventions, repeated and wide reading instruction, through a randomized controlled trial. Findings for each of the outcome constructs will be discussed separately.

Word Recognition

The first question addressed by this study examined the impact of the interventions on word recognition. An analysis of the post-test results of the letter word identification subtest of the Woodcock Johnson III indicated no significant differences ($p = .53$) for any condition. Effect sizes were small, favoring the comparison group over the treatment groups and small, favoring the RR group when compared to the WR group. This is particularly concerning since notes from informal observations indicate that students in the comparison groups were often engaged in practices that cannot be described as exemplary educational practices (i.e., independent practice or unengaged in any reading-related activity).

Other fluency intervention studies with secondary students reported similar results on measures of word recognition. Conte and Humphreys' (1989) conducted a fluency study in which they contrasted a treatment and a comparison condition. All participants in that study had to be of average intelligence (above 80 on the verbal and performance

scores on the WISC-R) and at least one year below instructional grade level on a measure of word attack and a measure of oral and silent reading.

In the Conte and Humphrey's study, the treatment group practiced repeated reading with an audiotape. First, the teacher and student previewed the text. Next, the student listened to a short passage once or twice and then began to track the words in the book as they were read on tape. The student then read the passage along with the tape and then without the tape. In the comparison condition, students simply read from basal readers. There were no positive effects for the intervention on measures of word identification (ES= .05) or word attack (ES= .03).

In another study, Allinder (2001) reported that students practiced oral reading instruction. On pretest measures of word identification and comprehension, student scores were less than one standard deviation below the mean. Therefore, these students were also not as low functioning as students were in the current study; however, similar results are reported. Allinder contrasted the effects of practicing oral reading with specific reading strategies with generic encouragement to do well. On measures of word attack, effects of the intervention were very small (ES= -.02). Effects were similar on word recognition (ES= -.05).

Other reading intervention studies focusing on *word recognition* interventions conducted with secondary students yield more successful results on measures of word recognition. Student samples in these studies did not typically include students scoring as low on pre-test reading-related standard scores as in the current study. For example, in a study by Bhattacharya and Ehri (2004), below average readers in grades 6-10 participated

in a word study intervention in which students were taught to orally divide multisyllabic words into syllables, state the number of syllables, match them to their spelling and blend the syllables to say the whole word. The authors found that while having students practice whole word reading versus providing no word reading instruction at all had a small to medium effect (ES = .43), teaching students a structural analysis approach (i.e., multi-syllabic chunking) had a large effect (ES = 1.40).

The sample in the Bhattacharya and Ehri (2004) study included students with pretest word identification standard scores in the 115-137 range which represents students at least 1-2 standard deviations above the mean. This is a sharp contrast to the sample in the current study whose standard score pretest means were approximately 2 standard deviations below the mean. Therefore, similar aged students who made gains in the Bhattacharya and Ehri study varied greatly from the sample in the current study in terms of aptitude, which may be a factor in the lack of positive effects in the current study, as well as the main factor which was the nature of the intervention.

Regardless, on measures of word recognition, similar fluency interventions had similar effects as this dissertation study did. It is possible that the focus of the intervention and the level of the participating students can affect gains made in the area of word recognition.

Fluency

My second research question examined the effect of RR, WR, and a typical instruction C group on students' outcomes on reading fluency. An analysis of the post-test results of the AIMSWeb oral reading fluency measure indicated that the difference in

post-test scores of the treatment and comparison groups was not significant (p= .85). Effect sizes were also small, favoring the comparison group compared to the treatment groups and small, favoring the repeated reading groups over the wide reading groups. The results of the Test of Silent Contextual Reading Fluency also indicated that there were no statistically significant differences between groups (p= .73) on measures of fluency. There was one small, positive effect (ES= .28) for the TOSCRF measure favoring the repeated reading group over the comparison group and a small effect favoring the repeated reading group over the wide reading group.

A similar peer pairing study, Fuchs et al. (1999), found better effects for repeated reading on a measure of oral reading fluency favoring the a peer pairing intervention over no peer pairing (ES=.11). This intervention, however, also included a comprehension component unlike the current study which also could have had an effect on these results.

Comprehension

The third question addressed by this study examined the effects of the different conditions on students' outcomes on measures of reading comprehension. An analysis of the post-test results of the comprehension subtest of the Woodcock Johnson III indicated that the difference in post-test scores of the treatment and comparison groups was not significant (p= .85). Analyses of student scores indicated no main effects for any condition. Effect sizes using Cohen's criteria (1988) revealed that students' scores resulted in small effects in favor of the comparison group over the treatment groups; however there was a very small effect favoring the wide reading group over the repeated reading group.

Students' scores on the TOSRE (Wagner et al., 2006) indicated no statistically significant effects for any treatment group providing further evidence that there was no significant effect for the impact of any intervention on reading comprehension. An analysis of the post-test results of the TOSRE indicated that the difference in the post-test scores of the treatment and comparison groups was not significant (p= .61). There was no main effect for any condition and again, even though there were no statistically significant results, I provided effect sizes. Effect sizes comparing the RR and WR group to the comparison group were both large, favoring the comparison condition and very small favoring the repeated reading group over the wide reading group.

The comprehension findings from this study are concurrent with two recent syntheses of research that examined the effectiveness of reading interventions with older students with reading difficulties (Edmonds et al. in press, Scammacca et al., in press). In the Edmonds et al. synthesis, interventions conducted with adolescent struggling readers (grades 6-12) that included word study, fluency, comprehension, and multi-component intervention approaches to improving reading comprehension were examined. Twenty nine studies were examined and 13 of these met criteria for inclusion in a meta-analysis. Results of the meta-analysis indicated a mean weighted average of ES= .89. The effects of word level, comprehension and multi-component interventions were associated with medium to high effects on comprehension; however, fluency interventions (n=1) resulted in no effect (ES= -.03) on comprehension.

Scammacca et al. (in review) extended the Edmonds et al (in press) meta-analysis by including students in grades 4-12 and including more recent studies for a total of 31

studies. They found similar effects with an ES of .26 for fluency intervention studies (n=4) on all reading comprehension measures, but a negative effect of -.07 (n=2) for standardized reading comprehension measures.

One difference between this dissertation study and other peer pairing studies which have had more success on measures of comprehension is that in this study, there was no comprehension strategy component beyond having partners ask each other for a summarization after their last read each day.

In a study by Fuchs et al. (1999), the effects of PALS on reading fluency, reading comprehension, and attitude towards reading was examined with high school students in their remedial and special education classes. Teachers implemented PALS five times every two weeks for 16 weeks with students whose instructional reading levels were at grades 2-6, the grades PALS had previously been validated with. PALS students showed significantly greater growth in reading comprehension than students in classrooms that did not use PALS; however, PALS and comparison students grew comparably on reading fluency outcomes. PALS sessions were comprised of partner reading, paragraph shrinking (summarization), and prediction relay. Unlike this dissertation study, the inclusion of such a strong comprehension component may have accounted for student gains in comprehension in the Fuchs et al. study. This can not be confirmed, however, as the effects of the different components of the intervention can not be disaggregated. The lack of a strong comprehension instructional component in this dissertation fluency study may contribute to the lack of gains in comprehension.

Summary and Implications

The findings from this study contrast markedly from findings from fluency interventions with younger students. Findings from fluency interventions with younger students with reading disabilities have been more positive (Chard et al., 2002). Specifically, the results have been promising for RR interventions with younger students; however, less work has been conducted with WR interventions. In fact, previous reports on fluency outcomes (Chard et al., 2002; Kuhn & Stahl, 2000; Meyer & Felton, 1999; NRP, 2000; Therrien, 2004; Wolf & Katzir-Cohen, 2001) revealed that repeated reading practice does improve speed as well as accuracy in reading for younger and older elementary students (Meyer & Felton, 1999). In addition, in the area of fluency, the NRP (2000) reports that repeated reading procedures can have a significant impact on the reading ability of beginning readers.

Why, then do the results from this dissertation study not reflect for older readers with reading difficulties the more positive findings for younger beginning readers? There are several possible reasons why students in this study did not adequately benefit from the interventions. One might question whether the findings are a function of the fact that the students in this study are older than students in previous studies with more success. A reasonable explanation about the lack of positive effects can be attributed to the sample and sample-intervention match in this study.

The Sample

A majority of the students who made up the sample in this study had pretest scores in the 5th percentile or lower on standardized measures of reading including

measures of word recognition, passage comprehension, and fluency. For example, pretest standard scores on the Woodcock Johnson measure of passage comprehension in the different treatment groups ranged from 65.50 to 71.14. On the Woodcock Johnson measure of word recognition, pretest average scores in the treatment groups ranged from 70.97-73.97. These scores, approximately 2 standard deviations below the mean, indicate that the sample represented some of the most challenged learners and overall, the most difficult students to teach.

Another intervention study with a similar sample also yielded no significant differences between treatment and comparison groups. This study examined the effectiveness of a multi-component reading intervention implemented with middle school students with severe reading difficulties (Denton, Wexler, Vaughn, & Bryan, in press). All students had received previous years of remedial and/or special education services with minimal response to instruction, similar to the students in the current study. Students in the Denton et al. study received daily, explicit small group instruction for 50 minutes over 13 weeks. With the exception of the sample being primarily Spanish-speaking English language learners (ELLs), the students in the Denton et al. study had a very similar aptitude level as the students in this dissertation study. Standard scores on standardized measures of word reading and passage comprehension were also approximately 2 standard deviations below the mean at pretest. In addition, pretest student mean oral reading fluency rates (words read correctly per minute) on a 5th grade passage were 59.04 in the treatment group and 51.20 in the typical practice group. In this dissertation study, students had comparably low rates of fluency ranging from 73.29 in

the wide reading group to 80.66 in the typical practice group on an 8th grade level passage. Despite the intensity of the intervention, treatment students in the Denton et al. study did not demonstrate significantly higher outcomes in word recognition, comprehension, or fluency than students in the school's typical instruction group, and neither group demonstrated significant growth over time.

The students in the current study, as well as the Denton et al. study, can be considered students with reading disabilities. The verbal reasoning ability of these students may have impacted the success of the intervention. Therefore, the minimal response of these students and lack of effects from the intervention may be due not only to an aspect of the intervention, but may also be a result of the very low performing readers included in the study.

In this study, I deliberately selected this population of very low performing students; however, it is difficult to make a difference with this understudied population. While the results of this study can enhance our knowledge regarding best practices and guide us towards areas of future research needed for this particular type of reader, it would be unwise to generalize these findings to higher functioning students.

Intervention-Sample Match: The Needs of the Sample

In addition to the possibility that the sample used in this intervention was a factor contributing to the lack of gains students made, I hypothesize that lack of gains were related to a mismatch between the intervention and the needs of the sample. Overall, the needs of the sample were most likely above and beyond the scope of this intervention. In this fluency study, many challenges arose from relying on the success of a practice based

on several key components: opportunities for practice and feedback from a more competent peer, incorporating a model of good reading (when one partner is at a higher level than the other), and the ability to pair partners appropriately resulting in partners working well with each other and partners benefiting from each others' abilities. Even though these key components were intended to be incorporated in the intervention, they were sometimes compromised because of logistical issues such as small classes resulting in an inability to pair students appropriately which will be discussed further below.

In addition to being able to read words accurately, fluency at some level may be related to processing ability/text reasoning. However, not only did the intervention ultimately have a weak instructional component in how to read words accurately and fluently, for a sample that had such low verbal reasoning ability, (according to WJ-C pre-test standard scores approximately 2 standard deviations below the mean), the intervention did not include a strong comprehension component. Reading fluently requires students to make efficient use of cognitive resources (Fletcher et al., 2007). Even when a student is a fairly accurate reader, fluency difficulties can occur because of a multitude of skills that can influence the amount of attention and energy a student has left for fluent reading (Denckla & Cutting, 1999). Interestingly, a recent report by Schatschneider et al., (2004) on the individual differences in performance on the reading portion of the Florida Comprehensive Assessment Test (FCAT) showed that not only text fluency, but *also* text reasoning and verbal knowledge account for equal variance on Florida State outcome tests in 7th and 10th grade, whereas text fluency accounts for substantially more variance with 3rd graders. Therefore, according to this report, as

students enter the upper grades, verbal knowledge and reasoning skills may play increasingly important roles. Students in the upper grades must not only demonstrate strong reading fluency ability, but they must also demonstrate text knowledge and verbal reasoning skills. Because text gets more complicated, for example, higher order thinking is required which may indicate that verbal reasoning ability may carry a heavy load as students get into the upper grades.

To make a positive impact, interventions must be designed accordingly and targeted at the population for whom they are most appropriate. Therefore, when choosing an intervention, it is important to consider the match between the intervention, the target outcomes, and the sample. The students in the current study had very low text reasoning ability according to scores on the measure of comprehension. However, this fluency intervention, which provided practice reading fluently, did not have an instructional component to enhance comprehension/processing ability.

In addition to there being no comprehension component in the intervention as well as minimal instructional opportunities, the text used may have also contributed to the lack of gains. In general, while there is some variation, researchers report that when conducting a fluency intervention with younger beginning readers, using independent level text or text that can be read accurately as the basis for fluency work can lead to the most positive outcomes (Chard et al., 2002; Meyer & Felton, 1999). In addition, a majority of the text researchers used in fluency interventions with the most positive outcomes for younger students is narrative text (Wexler et al., in press). Both of these factors mean that when interventions employ text that has fairly predictable text structure

and often has a high degree of word overlap, reading related gains at the elementary level often result. Rashotte and Torgeson (1985), for example, demonstrated that students made positive gains in fluency in text that shared a high degree of word overlap compared to repeatedly reading text that did not share common words.

Because students in this study were in the secondary grades I was aware that they would be expected to read and learn from expository test (Hudson, Lignugans-Kraft & Miller, 1993). Therefore, the intervention targeted students' reading of expository material at the instructional level of the lower reader in each pair. Because of the expository nature of the text, students in both conditions practiced with text that did not have the predictable text structure of narrative texts that they were more familiar with and the instructional level of the text did not ensure that students could read the words with high accuracy. In addition, students in the WR condition practiced reading fluently with text that did not have a high degree of word overlap because students read a different expository passage each time. It is possible that in addition to low processing ability as well as an inability to read text accurately and fluently, the different text related factors (including challenging text with unpredictable text structure) influenced the outcomes of this study. There is evidence that expository text is more difficult to read and comprehend than narrative text for most secondary-level students, and especially for students with LD (Saenz & Fuchs, 2002). Simply practicing reading expository text fluently did not provide sufficient instruction for these students. Students with reading disabilities may require explicit instruction in how to read expository text fluently and for meaning.

Overall, for all of these students, those performing at a higher level and those who for the most part demonstrated low rates of fluency and accuracy, as well as very low verbal reasoning and world knowledge skills, a much more intense intervention focused on more than just fluency *practice* may have been necessary to make overall gains in measures of reading. The interventions in this study did not include *instruction* in how to read more fluently, nor did it provide instruction in word level skills or strategies to enhance overall comprehension ability.

Findings Linked to Sub-Analyses

In addition to the primary questions, two sub-analyses were conducted to further examine the results of the intervention. While sample sizes of sub-groups were generally small and outcomes should be interpreted with caution, these outcomes may be useful to guide future research.

Reading Accurately and Fluently

One specific area that the students in this study struggled with was the ability to read accurately and fluently. Students must be able to read words "on sight" and effortlessly. To do this, students must have knowledge of word recognition strategies and especially in the upper grades when students are faced with complex text, they must possess knowledge of strategies to decode multi-syllabic words. When students are not accurate readers, they cannot be fluent readers.

To better understand the role of accurate word reading (as measured by word recognition), I divided the students into two groups: those who were 95% or more accurate on their median pre-ORF score and those who were 94% or less accurate. Based

on these two groups, I examined the impact of the intervention on students who were able to read words accurately. It is important to note, however, that this compromised the design and specifically the randomization of the study and therefore, the results should be used solely for future hypothesis generation.

Before linking the findings to the intervention, it is notable and evident that when looking solely at the descriptive post test standard score means, students in the higher level accuracy group across conditions and measures had pretest and posttest standard mean scores that were significantly greater (approximately 10-20 points) on measures of fluency (TOSCRF), word recognition (WJ-R), and comprehension (WJ-C) than those in the lower reading accuracy group. When controlling for pretest scores, students who made more growth on all measures were students in the higher accuracy group, indicating a possible higher correlation between students who read more accurately and benefit from a fluency intervention. Therefore, students who were more accurate readers generally performed at a higher level, also lending support to the hypothesis that there *is* value to being a more accurate word reader. There may be value in teaching any intervention associated with gains in word recognition.

However, even when disaggregating and examining the subgroup of students who *were* reading fairly accurately, there were still virtually no positive outcomes detected for this subgroup analysis. Only one small significant effect ($p = .04$) was found on the word recognition measure (WJ-R). This confirms that students who could read with accuracy improved on word reading with the fluency intervention. Specifically, students who read with accuracy in the wide reading group made more gains on the word recognition

measure than in the other two conditions. It is evident from adjusted posttest standard score means that students in the more accurate wide reading group read an average of 8 more words per minute than students in the less accurate wide reading group. Therefore, there may be value in terms of growth in word reading, for students reading with at least 95% accuracy on grade level material to participate in a WR intervention. There were no significant gains, however, in the areas of fluency or comprehension for students reading with 95% accuracy or more.

To determine if the intervention effects would vary for students reading accurately *and* at a higher rate, I conducted a second subgroup analysis. Students who were at least 95% accurate *and* who scored at least 100wpm on their median pre-ORF score were placed in one group while those who met criteria below this were placed in another group. Besides accuracy, I hypothesized that it was also valuable to be able to at least read at a certain rate (100wpm) at the secondary level. As previously stated, however, we know little about the levels of fluency required at the secondary level and what levels of fluency are needed when reading different text types and levels of text.

Again, as a general observation we can conclude that being a more accurate reader as well as a more fluent reader is more beneficial than not being accurate or fluent. Before linking any findings to the intervention, it is again notable that when looking solely at the descriptive pre and post test means of the students in the higher level accuracy and rate group across conditions and measures, their post test mean standard scores on measures of word recognition (WJ-R) and comprehension (WJ-C) were greater (approximately 10-20 points) than those in the lower reading accuracy and rate group

across conditions. Therefore, students in this study who were more accurate readers, and who read with at least at 100wpm, generally performed at a higher level and made more gains than students performing at a lower level, confirming value in being a more accurate and fluent reader.

While we are fairly certain that there are ways to increase reading accuracy for students with reading disabilities by spending time on word level interventions even at the secondary level (Edmonds et al., in press; Scammaca et al., 2007), we are not certain about how to increase reading rate. Although the descriptive means look promising, there were no significant differences for more accurate and fluent readers across conditions for any measure.

It is important to note that not only did these subgroup analyses sacrifice the design of the study, but the sample sizes for these subgroup analyses were also small and therefore, results should be interpreted with caution. Regardless, we can conclude that even students who read with a fair amount of accuracy and fluency prior to the intervention did not make considerable gains.

Limitations

This study was designed to control variables in order to effectively answer the primary research questions, as well as several secondary analyses. It was implemented, however, in a practical school context designed to meet goals beyond the research study. Therefore, several limitations may have influenced the effects and the interpretations of the results of this study and the findings should be interpreted within the limitations of research-based school implemented interventions.

Fluency Practice vs. Instruction: The Challenge of Peer Pairing

Both of the interventions utilized peer pairing/partner reading. Peer pairing was selected for two main reasons: (a) budget limitations prevented hiring tutors for all of the students, and (b) success with peer pairing in previously conducted studies with younger students. Because of a number of factors related to implementation such as lack of immediate, corrective feedback and modeling due to peer pairings that resulted in partners who barely read better than their peers with whom they were paired, the students received little good modeling, corrections and feedback. This minimized their *instruction* in how to become more fluent reader. Therefore, the intervention primarily provided students with opportunities to *practice* reading fluently. This may have been a factor in the lack of positive results on fluency outcomes.

Much of the research on partner reading has been conducted in general education classes where the majority of students were average or above readers and the target students with learning disabilities had ample opportunities to have partners who could model and provide feedback as fluent readers (Fuchs, et al, 1997; Greenwood, Carta, Kamps, & Hall, 1988). The use of peer-assisted learning strategies, however, has been extended upward in a number of more recent studies specifically aimed at improving reading comprehension (e.g. Fuchs et al, 1999; Harris, Marchand-Martella, & Martella, 2000; Mastropieri, et al., 2001). One commonly known approach to repeated reading, Peer-Assisted Learning Strategies for Reading (PALS), has many years of research in classrooms that demonstrate that PALS improves the reading achievement of low,

average, and high achieving students (Fuchs et al, 1997; McMaster, Fuchs & Fuchs, 2006; Simmons, Fuchs, Fuchs, Mathes, & Hodge, 1995).

In another study, Mastropieri, Scruggs, Mohler, et al. (2001) randomly assigned students with serious reading difficulties to either traditional teacher led instruction or a comprehension strategy based peer tutoring condition during 7th grade English classes. The intervention included partner reading and the implementation of summarization strategy instruction and practice. After 5 weeks, students in the tutoring condition significantly outperformed their peers on criterion referenced reading comprehension measures. One challenge noted was that many students expressed trouble decoding the text and at times neither student could read the text or the lower reader could not keep up with the higher level reader. Peer-assisted instruction for students in the upper grades may be enhanced when students are paired with a more competent reader.

Harris and colleagues (2000) for example, examined the effects of a peer-delivered Corrective Reading program (Englemann, Hanner, & Johnson, 1989) with RR on the reading performance of at-risk high school students. Results indicated that students made gains on a reading comprehension measure as well as their oral reading fluency. The difference in this intervention (compared to this dissertation study) is that students in the Marchand-Martella and Martella study did not begin at a level as low as students in this fluency study, this intervention included an element of word study, and while students were also paired in dyads or trios, the "peer" partner was actually a peer who performed a much higher level than the at-risk student. The peer instructors were 11th and 12th grade students who were given the opportunity to gain high school or college

credits for being peer instructors. These students were generally in honors English classes and received one session of training to implement the intervention, which included an overview of the Direct Instruction (DI) model and practice implementing repeated readings, giving corrective feedback and specific praise. Although this study had several limitations, including a lack of experimental design with no control, results suggest positive implications when struggling readers are paired with a more capable reader who can serve as a model.

Another related limitation in this dissertation study, as well as for teachers in many of these other studies with secondary students, was chronic absenteeism. When one student was absent, re-pairing the partner with another pair was often difficult because of social issues or because the teacher did not have another pair whose reading level was appropriate for the student. Because of chronic absenteeism at the high school level, many students in this study were forced to work in trios in which students would rotate who they worked with while one student worked alone, and some students had to work independently many times when their partner was absent. In the Fuchs et al (1999) study, they handled this issue by switching partners every day instead of every few weeks as was done in previous studies. They also note how high school students enjoy working with different peers. This is a challenge however, when the intervention is being implemented in small special education classrooms. Therefore, when teachers pair students with partners who may not be at an appropriate reading level match, or have students work independently because of absenteeism, the quality of feedback that

students receive is greatly compromised. Instead of *instruction* in reading fluently, students only *practice* reading fluently.

In a fluency synthesis targeting fluency interventions for struggling readers in grades 6-12 by Wexler et al., (in press), results showed that the interventions that consistently improved reading rate outcomes included a) a previewing procedure such as listening to an audiotape or model of good reading before reading text or b) providing corrective feedback (i.e., having an adult or more competent partner provide corrections while a student is reading). If partner or trio relationships are compromised, instruction may be sacrificed and therefore, outcomes can be negatively affected.

Implications for Practice

While these results do not support the implementation of RR and WR interventions alone in the classroom for this population, the study does not refute the idea that being a fluent reader is an important component of being considered an effective and efficient reader.

One implication from this study is that for students functioning at low reading levels, practice may not be sufficient. From the results of this study, we can conclude that implementing RR and WR interventions with very poor readers without more formative instruction is not likely to be valuable. Instead, teachers may consider designing interventions for severely impaired readers that provide more intensive and comprehensive instruction that is better situated to meet their specific needs.

Before secondary students can read text fluently, they need to be able to read words accurately. Therefore, a logical step after students demonstrate the ability to read

words accurately is to provide practice reading fluently. However, we know from the sub-analyses conducted that even those students who could read accurately did not make gains from this intervention. The most positive outcome from this intervention was that students who read with more accuracy prior to the intervention slightly improved on reading words accurately, a skill they were already fairly proficient in. Therefore, we can not assume that fluency practice alone will improve outcomes on fluency or comprehension for students who can already read accurately. This finding also applies to students who did not read accurately prior to the intervention.

It is possible that some other type of fluency intervention (perhaps at an even more intense level) or some other type of reading intervention (i.e., one targeting the needs of students with low word processing ability) may have a more positive effect on the word recognition, fluency, and comprehension ability of secondary struggling readers than the RR and WR practices implemented during this intervention did. For students functioning at a low reading level, interventions aimed at improving text reasoning and processing may also be considered. Therefore, fluency interventions alone may not be sufficient.

Until more research is conducted with this population, teachers have two main choices regarding these specific interventions: they can continue to borrow what is known from the research that has confirmed effective fluency practices for young, beginning readers or they can simply wait and not implement either of these interventions.

Teachers also must decide *which* fluency intervention (RR or WR) they would implement. Because there were no significant differences in the effectiveness of these interventions in this study, it would probably be wise for teachers to take a balanced approach between RR and WR if choosing to implement them at all. Having a balanced approach may ensure that students may benefit from the high degree of word overlap they are exposed to in the RR intervention (Rashotte & Torgeson, 1985). They may also benefit from the exposure to different content, text structure, vocabulary, and background knowledge from a WR intervention. Using text that is accessible to students reading at a low level should be another consideration as well as choosing whether students should engage in peer pairing or not. However, from the results of this study, I can not recommend implementing RR or WR with a similar sample.

Overall, educators should be aware of the established research and the needs of their students, so that they can provide interventions that are appropriate intervention-sample match.

Recommendations for Future Research

Despite the plethora of research regarding effective fluency instruction for young, beginning readers, there is a lack of converging evidence regarding how and if instruction in fluency improves secondary struggling readers' ability to read fluently, accurately and with comprehension.

It is also possible that these specific types of fluency interventions may benefit a certain type of reader. For example, results showed that students who read with at least

95% accuracy made more improvements on word recognition when participating in a wide reading intervention.

To confirm the possibility that there is a particular type of reader who may benefit from a similar intervention, more research in this area is necessary including replication of interventions with larger sample sizes. It seems necessary for educators to assess the needs of students and to match needs with appropriate interventions. Struggling readers vary in their needs and interventions targeted appropriately meet these needs are more likely to yield positive outcomes.

Instead of an intervention that provides only *practice*, for students functioning at such a low level, interventions, which focus on providing intensive and explicit *instruction* may be necessary. Because of frequent interruptions by students missing school for various reasons in the current study, peer pairing and the overall "flow" of the daily intervention was affected. More research that raises the intensity and amount of instruction students with reading disabilities receive in an intervention is recommended.

In conclusion, implementing a fluency intervention to not only improve reading rate, but also word recognition and comprehension ability may not be effective at the upper grades for this population. Instead of intensive instruction in how to become a fluent reader, students in the intervention (including many who were not accurate readers to begin with) received only practice reading fluently. A student who reads at a slow rate with poor accuracy and who has low word processing ability may benefit more from spending time reading and interacting with text through direct instruction in word recognition, word meaning, and comprehension strategy *instruction* in a very intense

intervention. More research is warranted to determine the best way to impact reading related outcomes for secondary students with reading disabilities.

Summary

The purpose of this study was to examine the effects of a RR and WR fluency intervention on the word recognition, comprehension, and fluency outcomes for secondary students with reading disabilities. No significant overall main effects were found for any condition: RR, WR, or the typical practice C condition on any measure of word recognition, fluency, or comprehension. This study contributes to the growing amount of reading related research regarding effective interventions for secondary students with reading disabilities.

Appendix A

Fluency Tables

Summary of design/intervention, participants, measures, and findings

Design/Intervention	Participants	Measure	Findings/Results
Fluency: Treatment/Comparison			
Allinder (2001) ▪ *T1:* Students use strategy during read aloud conferences (n = 33). ▪ *C:* Students do best reading (n = 16).	7th grade 49 (6 LD; 7 SPL; 1 OHI & SPL; 35 SR)	WJRM-Word ID WJRM-Word Attack WJRM-Comprehension Slope on Maze Task	*T1 vs. C;* ES = .05 *T1 vs. C;* ES = -.03 *T1 vs. C; ES*= -.33 *T1 vs. C;* ES = .79
Conte & Humphreys (1989) ▪ T1: In repeated reading with audiotape, the teacher and student previewed the text; student listened to a short passage once or twice and then began to track the words in the book as they were read on tape. The	9-13 yr. 26 (SR)	Oral reading Silent reading: Ekwall reading grade Oral Reading: Ekwall speed scores Silent Reading: Ekwall	*T1 vs. C;ES= .23* T1 vs. C; ES= .00 *T1 vs. C*; ES=.97 *T1 vs. C*; ES= 1.02

student reads the passage along with the tape and then without the tape (n= 13). ▪ C: Students read from basal readers (n = 13).		speed scores WRMT-Word attack WRMT- Comprehension Boder Test of Reading and Spelling Patterns	 *T1 vs. C*; ES = -.79 *T1 vs. C*; ES = -.16 *T1 vs. C*; ES = -.66
Fuchs et al. (1999) ▪ *T1:* Partner reading, paragraph shrinking, and prediction relay (n = 52). ▪ *C:* No peer pairing (n = 50).	16yr.; 9th grade 102 (74 LD; 4 MMR; 22 SR; 2 other)	CRAB: Oral reading fluency CRAB: Comprehension	*T1 vs. C*; ES = .11 *T1 vs. C;* ES = .25
Homan et al. (1993) ▪ T1: Pairs with teacher supervision, student reads same passage four times. (n = 13) ▪ T2: Students used: echo reading, unison reading,, cloze reading Students did not	6th 26 (SR)	Errors: Words read incorrectly Time: Minutes for a student to read passage Retellings: Unprompted	*T1 vs. T2*; ES = .04 *T1 vs. T2*; ES = -.51 *T1 vs. T2*; ES = -.36

repeat passages read (n = 13).		story retellings	
O'Shea et al. (1987) ▪ T1: Students were given a cue to read quickly and accurately. Students were exposed to all three levels of the repeated reading condition: one, three, and seven readings. (n = 16) ▪ T2: Students were given a cue to read for comprehension. Students were exposed to all three levels of the repeated reading condition: one, three, and seven readings. (n = 16)	11.3-13.6 yr. (M = 12.63) 5th-8th 29 (LD)	Reading Rate: The number of words read correctly divided by the total reading time *Note: A = 1 Reading B = 3 Readings C = 7 Readings Comprehension: The percentage of story propositions (POP) retold during the final reading *Note: A = 1 Reading	*T1A vs. T2A;* ES= -22 *T1B vs. T2B;* ES = -.02 *T1C vs. T2C;* ES = -.04 *T1A vs. T2B;* ES = -.77 *T1B vs. T2C;* ES = -.37 *T1A vs. T1B;* ES = -.64 *T1B vs. T1C;* ES = -.31

		B = 3 Readings 7 Readings	*T1A vs. T1C;* ES = -.99 *T1A vs. T2B ;*ES = -1.18 *T1A vs. T2C;* ES = -1.87 *T1B vs. T2C;* ES = -1.00 *T2A vs. T2B;* ES = -.38 *T2B vs. T2C;* ES = -.70 *T2A vs. T2C;* ES = -1.10 *T1A vs. T2A;* ES =

			-.82 *T1B vs. T2B;* ES = -.39 *T1C vs. T2C* ;ES = -.91 *T1A vs. T2B* ;ES = -1.12 *T1B vs. T2C;* ES = -1.0 *T1A vs. T1B;* ES = -.64 *T1B vs. T1C;* ES = -.02 *T1A vs. T1C;* ES = -.61

			T1A vs. T2B; ES = -.77 *T1A vs. T2C;* ES = -1.15 *T1B vs. T2C;* ES = -.37 *T2A vs. T2B;* ES = -.58 *T2B vs. T2C;* ES = -.42 *T2A vs. T2C;* ES = -.99
Rashotte & Torgeson (1985) ▪ T1: Students orally read one of seven unrelated non-overlapping stories four	Mean Age = 10.5 12 (LD)	• Number of words read correctly per minute	• Greater speed increases for lower abilities

times a day for 28 total readings. ▪ T2: Students again read repetitively except that the seven stories in this condition contained a high degree of shared words. ▪ T3: Students read four different stories each day, none of which were repeated. Over the seven day period students read 28 unrelated overlapping stories.		• Comprehension: RR vs Non-repetitive reading	and with text with high degree of word overlap • No significant gains • If stories had few shared words, RR is not more effective for improving speed than an equal amount of non-repetitive reading
Fluency: Single Group			
Carver & Hoffman (1981) Study One	9th-10th grade	• Rate of Good Reading	• 15% Gain

▪ T1: Students completed a maze passage on a computer-based instructional system by choosing one of the word choices that made the passage make the most sense. Each programmed prose passage was read on a PLATO IV computer terminal until mastery was achieved. *Note: No means or standard deviations reported	6 (SR)	(RGR): Measure gives a reading efficiency score which combines accuracy, rate, and grade level of passage • National Reading Standards Test *(standardized)* • Gates-MacGinitie *(standardized)*	• 3.6 grade equivalent (GE) gain • Little or no gain
Carver & Hoffman (1981) Study Two ▪ T1: Students completed a maze passage on a computer based instructional system by choosing one of the word choices that made	9th-10th grade Study 2: 6 (SR)	• Rate of Good Reading (RGR): Measure gives a reading efficiency score which	• 17% gain

the passage make the most sense. Each programmed prose passage was read on a PLATO IV computer terminal until mastery was achieved.		combines accuracy, rate, and grade level of difficulty of the passage. • National Reading Standards test (NRS) • Gates-MacGinitie reading test	• 3.4 grade equivalent (GE) gain • Little or no gain
Mercer et al. (2000) ▪ *T1 (19-25 months of instruction)* Instruction in phonics, sight phrases and oral reading. ▪ T2 *(10-18 months of instruction)* ▪ T3 *(6-9 months of instruction)*	6th-8th 49 (LD)	CBM of oral reading fluency	*T1:* Significant growth. *T2:* No significant effects shown. *T3:* Small effects.

<table>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="4">Fluency: Single Subject</td></tr>
<tr><td>Daly & Martens (1994)
▪ T1: Student read a passage with feedback
▪ T2: Student read along with an audiotaped word list.
▪ T3: Student listened to an audiotaped passage while following along silently.</td><td>11.11 yr.
2 (LD)</td><td>• Words read correctly per minute: Passage
• Words read correctly per minute: Word list</td><td>PND (%)<table><tr><td></td><td>T1</td><td>T2</td><td>T3</td></tr><tr><td>S3</td><td>14</td><td>0</td><td>71</td></tr><tr><td>S4</td><td>43</td><td>14</td><td>100</td></tr><tr><td>S3</td><td>0</td><td>0</td><td>14</td></tr><tr><td>S4</td><td>43</td><td>14</td><td>58</td></tr></table></td></tr>
<tr><td>Freeland et al. (2000)</td><td>7th-8th, 11th</td><td></td><td>PND (%)</td></tr>
</table>

▪ T: Students read passage aloud twice while the instructor followed along and corrected any errors made by the student. ▪ C1: Students read passage silently twice. (PND calculated as the percent of non-overlapping data between the control and experimental condition for each student)	12, 13, 16 yr. 3 (LD)	• Total # of comprehension ques. answered correctly • Factual # of comp. ques. answered correctly • Inferential # of comp. ques. answered correctly • Total rate of comp. (silent reading) • Factual rate of comp. (silent reading)	S1	57
			S2	14
			S3	100
			S1	57
			S2	57
			S3	71
			S1	14
			S2	14
			S3	0
			S1	14
			S2	14
			S3	57
			S1	71
			S2	86
			S3	100

		• Inferential rate of comp. (silent reading)	S1	0
			S2	0
			S3	14
Rose & Beattie (1986) ▪ T1: The teacher read the passage slowly at a conversational rate while the student followed along. ▪ T2: Same as listening condition except the teachers had prerecorded the passage.	11-6 yr 1(LD)	• Words read correctly per minute • Errors per minute	PND (%)	
				T1 T2
			S2	100 100
			S2	0 0
Rose & Sherry (1984) ▪ T1: The student read a passage silently, informed the teacher when he was finished, and read the passage aloud to the teacher. ▪ T2: The teacher read the assigned passage to the student who followed along. The	8th and 9th; 14-10 to 16-2 years 5 (LD)	• Words read correctly per minute	PND (%)	
				T1 T2
			S1	75 100
			S2	58 100
			S3	42 100
			S4	0 0

<table>
<tr><td>student then read the passage aloud to the teacher.</td><td></td><td></td><td>S5</td><td>60</td><td>77</td></tr>
<tr><td rowspan="5">Scott & Shearer-Lingo (2002)
▪ T1: A phonics based program where the teacher models letter sound correspondences, leading student through practice with the sounds, and then testing the students.
▪ T2: Involves daily 1-minute timings of each of three segments: phonics sounds, sight phrases, and a brief story.</td><td rowspan="5">7th grade
3 (SR/BD)</td><td rowspan="5">• Words read per minute</td><td colspan="3">PND (%)</td></tr>
<tr><td></td><td>T1</td><td>T2</td></tr>
<tr><td>S1</td><td>100</td><td>100</td></tr>
<tr><td>S2</td><td>100</td><td>95</td></tr>
<tr><td>S3</td><td>0</td><td>100</td></tr>
<tr><td rowspan="2">Shapiro & McCurdy (1989):
▪ T1: Each student initially read a vocabulary list aloud along with an audiotape recording. After the initial reading, students read the</td><td rowspan="2">9th and 10th grade;
14-16 years
5 (SR/BD)</td><td rowspan="2"></td><td colspan="3">PND (%)</td></tr>
<tr><td></td><td>T1 correct</td><td>T1 in-correct</td></tr>
</table>

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<tr>
<td>list again. Oral rates were obtained during the second reading. The lists were rotated so a student read the same list every 7 days and feedback was not provided. The student then read the passage and then removed the passage and answered five comprehension questions.</td>
<td></td>
<td>

Oral Reading Rates-Word Lists: Number of correct and incorrect words read per minute.
Oral Reading Rates-Passages: The number of words read correct and incorrect per minute.

<table>
<tr><td>S1</td><td>85</td><td>0</td></tr>
<tr><td>S2</td><td>65</td><td>6</td></tr>
<tr><td>S3</td><td>62</td><td>46</td></tr>
<tr><td>S4</td><td>78</td><td>0</td></tr>
<tr><td>S5</td><td>0</td><td>0</td></tr>
<tr><td colspan="3">PND (%)</td></tr>
<tr><td></td><td>T1 correct</td><td>T1 incorrect</td></tr>
<tr><td>S1</td><td>50</td><td>10</td></tr>
<tr><td>S2</td><td>0</td><td>0</td></tr>
<tr><td>S3</td><td>38</td><td>0</td></tr>
<tr><td>S4</td><td>67</td><td>0</td></tr>
<tr><td>S5</td><td>55</td><td>0</td></tr>
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</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>• Comprehension: Percent of correct comprehension questions answered correctly
• Target Words Read in Context: Percentage of each target word read correctly in each passage</td><td colspan="4">Data not shown Reported: Little change in responding except S2</td></tr>
<tr><td></td><td></td><td></td><td colspan="4">Mean gain</td></tr>
<tr><td></td><td></td><td></td><td>S1</td><td colspan="3">2.9</td></tr>
<tr><td></td><td></td><td></td><td>S2</td><td colspan="3">13</td></tr>
<tr><td></td><td></td><td></td><td>S3</td><td colspan="3">1.2</td></tr>
<tr><td></td><td></td><td></td><td>S4</td><td colspan="3">4.3</td></tr>
<tr><td></td><td></td><td></td><td>S5</td><td colspan="3">3.6</td></tr>
<tr><td></td><td></td><td></td><td colspan="4"></td></tr>
<tr><td>Skinner et al. (1997)
▪ C1: The student read a passage silently.</td><td>12 yr.
5th-6th grade</td><td></td><td colspan="4">PND (%)</td></tr>
<tr><td></td><td></td><td></td><td></td><td>C1</td><td>T1</td><td>T2</td></tr>
</table>

<table>
<tr>
<td>

T1: The student read silently as the experimenter read aloud the passages at a reduced rate of about 50 wcpm.
T2: The student read silently as the experimenter read aloud at his natural rate.

(PND calculated as the percent of non-overlapping data between the control and experimental condition for each student)
</td>
<td>2(1 LD; 1 LD/BD)</td>
<td>

Words correct per minute
Mean words correct per minute
Mean errors per minute

</td>
<td>
<table>
<tr><td>S1</td><td>0</td><td>100</td><td>63</td></tr>
<tr><td>S2</td><td>0</td><td>14</td><td>0</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>S1</td><td>29</td><td>65</td><td>31</td></tr>
<tr><td>S2</td><td>26</td><td>42</td><td>31</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td>S1</td><td>5.6</td><td>4.4</td><td>5.0</td></tr>
<tr><td>S2</td><td>6.3</td><td>4.8</td><td>5.3</td></tr>
</table>
</td>
</tr>
<tr>
<td>
Skinner & Shapiro (1989)

T1: The students were given a vocabulary worksheet from a randomly assigned set of words and read the words once with an audiotape. Then they were assessed on the same words.

</td>
<td>
14-18yr
4 (SR/BD)
</td>
<td>

Words read correctly per minute

*Note: True PND for S3 and S4 only because
</td>
<td>
PND (%)
<table>
<tr><td></td><td>T1</td><td>T2</td></tr>
<tr><td>S1</td><td>58</td><td>83</td></tr>
<tr><td>S2</td><td>50</td><td>67</td></tr>
<tr><td>S3</td><td>58</td><td>42</td></tr>
<tr><td>S4</td><td>75</td><td>83</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>▪ T2: The students were given a vocabulary worksheet from a set of words assigned to that condition and were instructed to read all the words aloud. They were then assessed on the same words.</td>
<td></td>
<td>baseline is simultaneous for S1 and S2

• Mean number of words correct

• Mean number of words incorrect</td>
<td>
<table>
<tr><td></td><td></td><td></td></tr>
<tr><td>S1</td><td>88</td><td>95</td></tr>
<tr><td>S2</td><td>58</td><td>59</td></tr>
<tr><td>S3</td><td>69</td><td>59</td></tr>
<tr><td>S4</td><td>101</td><td>98</td></tr>
<tr><td colspan="3"></td></tr>
<tr><td>S1</td><td>2.8</td><td>2.3</td></tr>
<tr><td>S2</td><td>2.5</td><td>1.5</td></tr>
<tr><td>S3</td><td>4.6</td><td>11.8</td></tr>
<tr><td>S4</td><td>2.8</td><td>3.1</td></tr>
</table>
</td>
</tr>
<tr>
<td>Steventon & Frederick (2003)
▪ T: Repeated reading was added to the program Corrective Reading; during the check out portion of the lesson the teacher instructed the student to read the passage</td>
<td>15 (high school)
1 (LA)</td>
<td>• Words read correctly per minute: practiced and unpracticed passages</td>
<td>PND (%)
S1 practiced: 54
S2 unpracticed: 8</td>
</tr>
</table>

<table>
<tr><td>three times and then a fourth for data collection.</td><td></td><td>• Errors per minute (EWPM): practiced and unpracticed passages</td><td colspan="3">Mean decreased error rate= 1.4 errors per minute</td></tr>
<tr><td>Strong et al. (2004)
▪ T1: A program based on Direct Instruction that teaches decoding strategies through lessons that consist of word attack skills, group reading, and workbook exercises
▪ T2: T1 plus partner reading that consisted of two repeated choral readings with a RA providing corrective feedback followed by one round of partner reading with the</td><td>12-14yr.
7th-8th grade
6 (SR/BD)</td><td>• Words correct per minute: SRA probes, a near-transfer measure (independent level text)</td><td colspan="3">PND (%)
<table><tr><td></td><td>T1</td><td>T2</td></tr><tr><td>S1</td><td>29</td><td>92</td></tr><tr><td>S2</td><td>29</td><td>100</td></tr><tr><td>S3</td><td>45</td><td>83</td></tr><tr><td>S4</td><td>36</td><td>100</td></tr><tr><td>S5</td><td>73</td><td>50</td></tr><tr><td>S6</td><td>47</td><td>75</td></tr><tr><td>S1</td><td>0</td><td>33</td></tr></table></td></tr>
</table>

<table>
<tr><td>partner providing corrective feedback.

NOTES: Effects did not generalize to a 7th grade passage-average of about 50% less on PND for T2</td><td></td><td>• Words correct per minute: Seventh grade probes, a generalization measure (instructional/frustration level text)
• Mean number of comprehension questions answered: SRA probes</td><td>S2</td><td>29</td><td>58</td></tr>
<tr><td></td><td></td><td></td><td>S3</td><td>18</td><td>67</td></tr>
<tr><td></td><td></td><td></td><td>S4</td><td>0</td><td>50</td></tr>
<tr><td></td><td></td><td></td><td>S5</td><td>13</td><td>50</td></tr>
<tr><td></td><td></td><td></td><td>S6</td><td>27</td><td>50</td></tr>
<tr><td></td><td></td><td></td><td></td><td>T1</td><td>T2</td></tr>
<tr><td></td><td></td><td></td><td>S1</td><td>100</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td>S2</td><td>0</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td>S3</td><td>100</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td>S4</td><td>100</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td>S5</td><td>100</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td>S6</td><td>100</td><td>100</td></tr>
<tr><td></td><td></td><td></td><td colspan="3"></td></tr>
<tr><td>Valleley & Shriver (2003)</td><td>15,16yr.</td><td></td><td>S1</td><td colspan="2">6-10</td></tr>
</table>

▪ T: Students engaged in repeated readings in which the student rereads the same passage until he/she exhibits three consecutive fluency improvements.	9th-10th 3 (LD)	• 4th grade comp. questions; range of # correct • 5th grade comp. questions; range of # correct) • Words correct per minute (compared to 4th grade baseline) • Words correct per minute (compared to 5th grade baseline)	S2	4-10
			S3	6-10
			S1	10-10
			S2	5-10
			S3	9-10
			S1	12
			S2	24
			S3	17
			S1	100
			S2	100
			S3	100

Note. T = Treatment; C = Comparison; WRMT = Woodcock Reading Mastery Test; CRAB = Comprehensive Reading Assessment Battery; CBM = Curriculum-Based Measures; ES = effect size; PND = Percent of Non-overlapping Data; wcpm = Words Correct Per Minute; RR = Repetitive Reading: GE = Grade Equivalent; RA = Research Assistant; S = Student

Note. LD = Learning Disability; SR = Struggling Reader; BD =Behavior Disorder; LA = Low achiever; OHI = Other Health Impairment; SPL = Speech/Language Impairment; MMR = Mild Mental Retardation; NR=Not reported; M = Mean; yr. = year

Appendix B

Treatment Integrity Checklist

Please indicate with a mark (x) if the following step was completed:

_____Step 1: The teacher directs students to take out their respective passages. (Students find passages previously placed in their folders)

_____Step 2: The teacher tells P1s to read their first passage to P2 aloud. The teacher tells the students to begin and starts the timer for 1 minute.

_____Step 3: When the timer sounds, the teacher instructs P1 to stop reading.

_____Step 4: The teacher instructs P2s to record WCPM on the passage for their partners.

_____Step 5: The teacher then directs P2s in the RR group to get ready to read the passage again and P2s from the WR group to read their first passage (a different passage then P1s first passage). The teacher tells the students to begin and starts the timer for 1 minute.

_____Step 6: When the timer sounds, the teacher instructs P2s to stop reading.

_____Step 7: The teacher instructs P1s to record WCPM on the passage for their partners.

_____Step 8: The teacher then directs P1s in the RR group to get ready to read the passage again and P1s from the WR group to read their second passage. The teacher tells the students to begin and starts the timer for 1 minute.

_____Step 9: When the timer sounds, the teacher instructs P1s to stop reading.

_____Step 10: The teacher instructs P2s to record WCPM on the passage for their partners.

_____Step 11: The teacher then instructs P2s to provide error correction feedback for P1s.

_____Step 12: The teacher then directs P2s in the RR group to get ready to read the passage again and P2s from the WR group to read their second passage. The teacher tells the students to begin and starts the timer for 1 minute.

_____Step 13: When the timer sounds, the teacher instructs P2 readers to stop reading.

_____Step 14: The teacher instructs P1s to record WCPM on the passage for their partners.

_____Step 15: The teacher then instructs P1s to provide error correction feedback for P2s.

_____Step 16: The teacher then directs P1s in the RR group to get ready to read the passage again and P1s from the WR group to read their third passage. The teacher tells the students to begin and starts the timer for 1 minute.

_____ Step 17: When the timer sounds, the teacher instructs P1 readers to stop reading.

_____ Step 18: The teacher instructs P2s to record WCPM on the passage for their partners.

_____Step 19: The teacher instructs P2 to ask P1 to summarize what they had just read.

_____Step 20: The teacher then directs P2s in the RR group to get ready to read the passage again and P2s from the WR group to read their third passage. The teacher tells the students to begin and starts the timer for 1 minute.

_____Step 21: When the timer sounds, the teacher instructs P2 readers to stop reading.

_____Step 22: The teacher instructs students to record WCPM on the passage for their partners.

_____Step 23: The teacher instructs P1 to ask P2 to summarize what they had just read.

_____Step 24: The teacher directs the students to graph their hot read result (RR) and best read result (WR)

_____During the intervention, the teacher monitored at least two different reads using the monitoring checklist.

Appendix C

Sample Student Assent Letter

I agree to be in a study about reading. This study was explained to my mother/father and or guardian and they said that I could be in it. The only people who will know about how I do in the study will be the people in charge of the study, my teacher and principal, and my parents.

In the study, I may work with a partner to improve my reading skills. We will work on better ways to read faster and more accurately. I know that I will be given a pre-test to determine how well I am doing in different areas of reading and a test after the study to see how I improved. I will also track my reading progress during the study.

Writing my name on this page means that the page was read (by me/to me) and that I agree to be in the study. I know what will happen to me. If I decide to quit the study, all I have to do is tell the person in charge. If I at all feel distressed while participating in the study, I will contact my school counselor.

_____ _____

Child's Signature Date

_____ _____

Signature of Researcher Date

Appendix D

Sample Parent Consent/Student Assent Letter

CONSENT FORM
The Effects of Repeated Reading and Wide Reading on the Comprehension, Fluency, and Word Reading Ability of Adolescent Struggling Readers

You are being asked to allow your child to participate in a research study. This form provides you with information about the study. The person in charge of this research will also describe this study to you and answer all of your questions. Please read the information below and ask any questions you might have before deciding whether or not to take part. Your participation is entirely voluntary. You can refuse to participate without penalty or loss of benefits to which you are otherwise entitled. You can stop your participation at any time and your refusal will not impact current or future relationships with UT Austin or participating sites. To do so simply tell the researcher you wish to stop participation. The researcher will provide you with a copy of this consent for your records.

The purpose of this study is to determine the relative effects of repeated reading and wide reading on comprehension, fluency, and word reading outcomes for students identified with learning disabilities in reading, dyslexia, or students with significant reading difficulties. Classes will be matched on variables of interest (i.e. reading level) and then students will be randomly assigned to one of three groups within each class: repeated reading, wide reading, or typical instruction. Teachers, trained by the investigator, will monitor students as they work in pairs in each treatment condition.

If you agree to be in this study, we will ask your child to do the following things:

- Participate daily in a 12-15 minute reading fluency intervention if assigned to the repeated reading or wide reading condition.
- Continue to participate for the 12-15 minutes of the reading fluency intervention with the "regular" teacher in typical school practice if assigned to the typical school practice condition.
- Participate in pre/post testing and bi-weekly progress monitoring to determine progress in word recognition, comprehension, and fluency outcomes.

Total estimated time to participate in study is 10 weeks (47-55 sessions) daily for 12-15 minutes in the student's reading or English class.

Risks of being in the study

- This intervention may involve risks that are currently unforeseeable. If you wish to discuss the information above or any other risks your child may experience, you may ask questions now or call the Principal Investigator listed on the front page of this form.

Benefits of being in the study are that your child may benefit by the fact that we will continually monitor his/her progress in learning to read and we will give this information to you and to his/her reading or English teacher. Your child may benefit by having greater success in learning to read.

Compensation:

- You will not be provided any monetary compensation for your participation.

Confidentiality and Privacy Protections:

- The data resulting from your participation may be made available to other researchers in the future for research purposes not detailed within this consent form. In these cases, the data will contain no identifying information that could associate you with it, or with your participation in any study.

The **records** of this study will be stored securely and kept confidential. Authorized persons from The University of Texas at Austin, members of the Institutional Review Board, and Austin Independent School District have the legal right to review your child's research records and will protect the **confidentiality** of those records to the extent permitted by law. All publications will exclude any information that will make it possible to identify you as a subject. Throughout the study, the researchers will notify you of new information that may become available and that might affect your decision to remain in the study.

Contacts and Questions:

If you have any questions about the study please ask now. If you have questions later, want additional information, or wish to withdraw your child's participation call the researchers conducting the study. Their names, phone numbers, and e-mail addresses are at the top of this page. If you have questions about your child's rights as a research participant, complaints, concerns, or questions about the research please contact Lisa Leiden, Ph.D., Chair of The University of Texas at Austin Institutional Review Board for the Protection of Human Subjects, (512) 471-8871 or email: orsc@uts.cc.utexas.edu.

You may keep the copy of this consent form.

You are making a decision about allowing your adolescent youth to participate in this study. Your signature below indicates that you have read the information provided above and have decided to allow him or her to participate in the study. If you later decide that you wish to withdraw your permission for your adolescent youth to participate in the study, simply tell me. You may discontinue his or her participation at any time.

_____
Printed Name of (son/daughter/adolescent youth)

_____ _____
Signature of Parent(s) or Legal Guardian Date

_____ _____
Signature of Investigator Date

Assent form for child between 13 and 17 years of age

"I have read the description of the study titled "The Effects of Repeated Reading and Wide Reading on the Comprehension, Fluency, and Word Reading Ability of Adolescent Struggling Readers" that is printed above, and I understand what the procedures are and what will happen to me in the study. I have received permission from my parent(s) to participate in the study, and I agree to participate in it. I know that I can quit the study at any time."

_____ _____
Signature of Child Date

Appendix E

Information Letter to Parents/Guardians

Dear Parent/Guardian,

The purpose of this letter is to give you more information regarding the reading intervention that you and/or your student gave permission to participate in. The study will be conducted during the first 15-20 minutes of your child's reading class by a highly qualified and trained teacher. Your child's "regular teacher" will still be present in the classroom during the time when the intervention is being conducted.

Specifically, your child will be randomly assigned to participate in one of three groups. The first group is a repeated reading group. In this group, students will be assigned to work with a partner on a similar reading level. The pairs will take turns reading one passage a total of six times. The students will be trained to track their partners' errors, provide error correction, and calculate words read correct per minute. The second group is a wide reading group. This group will follow a similar procedure as the repeated reading group and will also participate in instruction in pairs. Students in this group, however, will take turns reading three different passages each for a total of six passages read. The last group is a typical instruction comparison group. Students in this group will receive instruction from their "regular teacher". The goal is to determine the effects of each intervention on students' reading fluency (the ability to read text with speed, accuracy and prosody), comprehension (the ability to make meaning from text), and word reading accuracy.

Your child will be pre-tested at the beginning of the study and post-tested at the end of the study to determine what types of gains might be made. We will also track your student's progress during the course of the study by administering one minute timed readings. This will help us determine the rate and accuracy at which your child is reading. Your child may benefit from participation in this study by improving his reading ability. Your student's scores will be kept highly confidential and your student will not be identified in any way. If at any time you feel uncomfortable about your child's participation in this study or have any further questions, please do not hesitate to contact me.

I am excited about the possibility of improving your child's reading ability and hope you are as well!

Sincerely,

Jade Wexler
512 799 3385

Appendix F

Repeated Reading Procedure

Partner Reading Procedure: Repeated Reading

Cold Read:	1. P1 reads / P2 Follows along Underlines errors Circles last word Calculate WCPM 2. P2 reads / P1 Follows along Underlines errors Circles last word Calculate WCPM
Practice:	3. P1 reads / P2 Follows along Underlines errors Circles last word Calculate WCPM **Error Correction** 4. P2 reads / P1 Follows along Underlines errors Circles last word Calculate WCPM **Error Correction**
Hot Read:	5. P1 reads / P2 Follows along Underlines errors Circles last word Asks for summarization Calculate WCPM 6. P2 reads / P1 Follows along Underlines errors Circles last word Asks for summarization Calculate WCPM
Graph:	7. Graph your own hot read results

Appendix G

Partner Reading Procedures for Uneven Groups or Absenteeism

In a group with EVEN pairs:

- When one student is absent, their partner reads silently. This partner can read and mark their stopping point just like they would normally do but this time they are by themselves. They won't get error correction during the second read but otherwise they can follow along with the group.
- If two students are absent, put their partners together and use the lower reader's passage. Take an extra passage (if needed) from the absent student's folder.
- If a partner is consistently absent, his partner will rotate among other partners (who are similar in level) taking turns having one student silent read. They will always use the passage of the lower reader in each pair. If you need help making groups, please let us know.

In a group with ODD numbers

- One student will rotate reading silently with a group of students reading at a similar level. The teacher should put together a group of 5 students. One student is always reading silently each day but this rotates. If you need help making groups, please let us know.
- However, IF another student not in the group of 5 is free (because his partner was absent) pair the odd numbered student with the partner-less student.

Appendix H

Monitoring Procedures

The interventionist will fill out the monitoring chart on at least two students each day. She will fill in the appropriate information on the monitoring chart.

Fluency Monitoring

Student	Date	Grade	Passage Level	What Read? (cold, practice, hot)	RR or WR?	Teacher WCPM	Student WCPM

Appendix I

Error Correction Procedures

Partner: “Here are the words I underlined. Let’s read these together.”

Students then read the underlined words together.

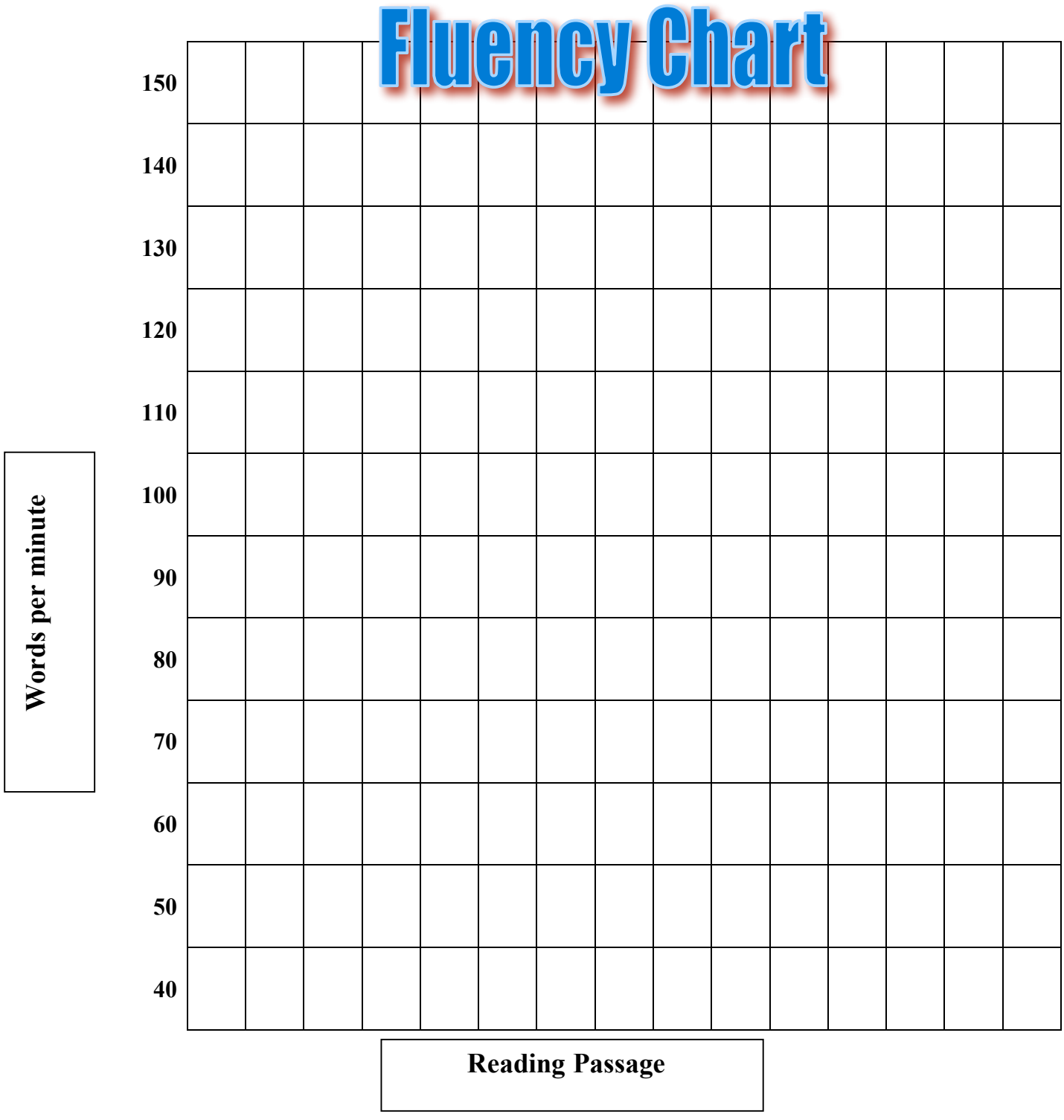
Partner: “Are there any other words you would like to review?”

If yes, students review words.

If no, students move on

Appendix J

Fluency Chart



Appendix K

Wide Reading Procedure

Partner Reading Procedure: Wide Reading

Cold Read 1: (Passage A and B)	1. P1 reads A/ P2 Follows along Underlines errors Circles last word Calculate WCPM 2. P2 reads B/ P1 Follows along Underlines errors Circles last word Calculate WCPM
Cold Read 2: (Passage C and D)	3. P1 reads C/ P2 Follows along Underlines errors Circles last word Calculate WCPM **Error Correction** 4. P2 reads D/ P1 Follows along Underlines errors Circles last word Calculate WCPM **Error Correction**
Cold Read 3: (Passage E and F)	5. P1 reads E/ P2 Follows along Underlines errors Circles last word Asks for summarization Calculate WCPM 6. P2 reads F/ P1 Follows along Underlines errors Circles last word Asks for summarization Calculate WCPM
Graph:	7. Graph your own best read results

Appendix L

Documentation of Reading Instruction ’07-‘08

Student Name: _____

Instructions: The purpose of this instrument is to document remedial reading instruction the student receives during the school day for the 2007-2008 spring semester. Please do not include any services that the student receives before or after school. Obtain the student’s schedule and complete the following information (you may also need to meet with the school counselor to determine the classes that are remedial reading):

1. Does this student receive any remedial reading instruction during the school day?

   YES NO

   IF #1 = NO - STOP

   IF #1 = YES - PROCEED to #2

2. How many types of remedial reading instruction does this student receive?

   1, 2, 3, 4

3. List each type of remedial reading instruction and the designated instructor:

Class	Period	Teacher
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

Instructions: For each type of remedial reading instruction, please complete one of the following sets of nine questions with designated teacher.

1. What is the name of the curriculum/program, or the type of service that is utilized?

    a. Special Education/Speech Therapy
    b. Dyslexia
    c. Title I/Chapter I Reading
    d. Other Reading/Literacy Instruction (Describe)

2. Who delivers the service?

    a. Certified Teacher
    b. Paraprofessional/Student Teacher
    c. Trained Volunteer
    d. Untrained Volunteer
    e. Other (please specify who)

3. Which specific credentials does this service provider have? (Circle all that apply)

    a. Regular Content Area Teaching Credential (content area: _____)
    b. Bilingual Credential Emphasizing Primary Language Instruction for ELL's
    c. English as a Second Language Credential Emphasizing English Language Instruction for ELL's
    d. Reading or Reading Specialist Credential
    e. Special Education Credential
    f. Emergency, intern, or some other temporary or provisional certification
    g. Dyslexia Credential
    h. Speech Credential
    i. Gifted and Talented Credential
    j. Not yet Credentialed / Not Certified
    k. Other (Describe) _____

4. How often is this additional instruction received?

    a. once a week
    b. 2 times a week
    c. 3 times a week
    d. 4 times a week

e. 5 times a week
f. More than 5 times a week

5. How long does each session of this instruction last (in minutes)? _____

6. What is the size of the group receiving this instruction?

a. one-on-one
b. 2-5 students
c. 5-10 students
d. 10-15 students
e. More than 15 students

7. In which month did this additional instruction begin (if it has not yet begun, in what month do you expect it to begin)?

a. August
b. September
c. October
d. November
e. December
f. January
g. February
h. March
i. April
j. May
k. Unknown

8. When will this additional instruction end?

a. August
b. September
c. October
d. November
e. December

f. January
g. February
h. March
i. April
j. May
k. Unknown

9. What criterion was used to determine the student should receive this additional reading instruction?

a. Identified with a reading or language disability

b. Identified as at-risk based on TAKS score

c. Identified as at-risk by district/school assessments other than TAKS

d. Recommended by teacher

e. Parent request

Other (Please specify): _____

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